

## PLANTS COLLECTED IN ECUADOR BY W. H. CAMP

## VACCINIACEAE

A. C. SMITH

In 1944 and 1945, Dr. W. H. Camp made very extensive collections of plants in Ecuador, among which were included approximately 300 numbers of the family Vacciniaceae. Because of his special studies of this family, Dr. Camp's material and field-notes are of the greatest interest and value. At his request the writer has undertaken the identification of these specimens and has described those that appear to represent new species. That there are 29 such species described in this paper reflects on the industry and perspicacity of Dr. Camp and his assistants, F. Prieto and H. Jorgensen, as well as upon the little-known nature of the flora of Ecuador. In this country and in Colombia the Vacciniaceae reach their highest development in America, both as to number of species and diversity.

The first set of the material upon which this paper is based is deposited in the herbarium of the New York Botanical Garden, and a second set in that of the U. S. National Museum. All the specimens of the family collected are cited and are represented in both herbaria unless followed by the annotation "NY only." A few other specimens are mentioned, the place of deposit being shown by the standard symbols: A (Arnold Arboretum); Ch (Chicago Natural History Museum); NY (New York Botanical Garden); US (U. S. National Herbarium). Genera are discussed in the sequence proposed by H. Sleumer's "Vaccinioideen-Studien" (Bot. Jahrb. 71: 375-408. 1941).

*Gaylussacia loxensis* Sleumer, Bot. Jahrb. 71: 384. 1941.

Azuay: "Oriente" Border, east slope of Eastern Cordillera, between Oña and the Río Yacuambi, 8,000-9,500 ft. elev., *F. Prieto P-265* (NY only) (shrub 1 m.; corolla bright pink).

This unicate collection agrees very well with the original description of *G. loxensis*, but I have not compared it directly with type material (*Lehmann 4965* pro parte). As compared with the description, our specimen differs only in its somewhat more pilose flowers and slightly longer corolla (to 9 mm. long at anthesis).

*Themistoclesia inflata* A. C. Smith, sp. nov.

Frutex epiphyticus pendulus, ramulis gracillimis elongatis cinereis juventute obscure puberulis mox glabratis; petiolis subteretibus incrassatis rugulosis 2-2.5 mm. longis; laminis in vivo succulentibus inflatisque in sicco coriaceis fuscis, ovato-ellipticis, 3.5-6 cm. longis, 1.5-3.2 cm. latis, ad basim truncato-rotundatum vel minute auriculatum gradatim angustatis, apice in acuminem circiter 1 cm. longum acutum terminantibus, margine incrassatis et leviter recurvatis, supra glabris, subtus pilos breves castaneos glandulosos in foveolis minutis depressos gerentibus, e basi ut videtur 5-nerviis, costa et nervis secundariis supra inconspicue impressis vel ut venulis immersis; floribus supra-axillaribus ut videtur solitariis vel paucis in rhachi minuta subfasciculatis, bracteis oblongis acutis haud 1 mm. longis hispidulo-marginatis; pedicellis gracilibus sub anthesi 12-17 mm. longis leviter curvatis pilis albidis 0.2-0.3 mm. longis copiose hispidulo-puberulis basim versus obscure bibracteolatis, bracteolis subulatis haud 0.5 mm. longis caducis; calyce turbinato sub anthesi 5-6 mm. longo et circiter 4 mm. apice diametro ut pedicellis puberulo, tubo inconspicue 5-angulato 3-4 mm. longo, limbo suberecto quam tubo brevior intus glabro inconspicue 5-lobato, lobis late

deltoideis apiculatis 0.5-1 mm. longis, sinibus rotundatis; disco annulari-pulvinato glabro; corolla glabra tenuiter camosa late urceolata circiter 7 mm. longa et medium versus 4.5 mm. diametro, basi et apice paullo angustata, lobis 5 deltoideis subacutis circiter  $1.5 \times 2$  mm. sub anthesi reflexis; staminibus 10 longitudine corollam fere aequantibus leviter inaequalibus, filamentis pallidis ligulatis liberis alternatim circiter 1.5 mm. et 1.8 mm. longis superne pilis circiter 0.5 mm. longis dorso hispidulis, antheris 4.5-5 mm. longis, thecis granulatis 1.7-2 mm. longis basi obscure mucronulatis, tubulis gracillimis quam thecis longioribus et multo angustioribus per rimas circiter 0.5 mm. longas dehiscentibus; stylo tereti corollam subaequante basim versus leviter incrassato, stigmatate minuto.

Chimborazo: Cañon of the Río Chanchan, about 5 km. north of Huigra, 5,000-6,500 ft. elev. (moist forested valleys in the afternoon fog-belt), May 19-28, 1945, Camp E-3363 (TYPE US 1,989,082; dupl. NY) (hanging epiphyte; leaves crisp-succulent, to 4 mm. thick, dark translucent-green, inflated above, pale below with stomata, the surface with numerous pits, the bases of glands; lower  $\frac{1}{2}$  of the leaf in cross-section with chlorenchyma, the upper  $\frac{1}{2}$  with apparently 4 cell-layers of hydrenchyma; corolla cream-white, the anthers orange).

This very distinct species is most closely allied to the Colombian *T. rostrata* A. C. Smith, from which it differs in having its leaf-blades somewhat smaller, narrower at base, thicker and inflated when fresh, and with immersed venation and gland-hairs sunk in small pits on the lower surface. The new species is further distinguished by its very slender anther-tubules, which are not characteristic of *Themistoclesia*. Slender tubules of this type have been noted in the Colombian *T. crassifolia* Sleumer (Bot. Jahrb. 71: 392. 1941), to which *T. inflata* is also allied. However, *T. crassifolia* has much larger and obviously cordate leaf-blades and an elongate inflorescence, among other characters which distinguish it from the new species.

*Themistoclesia cutucuensis* A. C. Smith, sp. nov.

Frutex epiphyticus, ramulis gracilibus fuscis obtuse angulatis juventute albido-puberulis mox glabratis; stipulis intrapetiolearibus subulatis 3-5 mm. longis primo puberulis; petiolis leviter canaliculatis 2-5 mm. longis ut ramulis puberulis; laminis chartaceis vel subcoriaceis in sicco pallide viridibus vel metallicoolivaceis, anguste elliptico-oblongis, (4-)6-10 cm. longis, (1.2-)1.5-2.5 cm. latis, basi anguste rotundatis vel subcordatis, apice angustato obtusis, margine integris valde revolutis, juvenilibus utrinque parce strigillosis (pilis brevibus castaneis glandulosis) etiam puberulis, supra mox subtus demum glabratis, costa supra impressa subtus elevata, nervis secundariis principalibus utrinsecus 2 vel 3 inconspicuis e costa basim versus orientibus utrinque prominulis, rete venularum utrinque prominulo vel subimmerso; inflorescentia axillari solitaria racemosa 8-12-flora bracteis paucis papyraceis lanceolatis 3-5 mm. longis parce puberulis basi circumdata, rhachi gracili angulata sub anthesi pedunculo 1-2 cm. longo incluso 5-11 cm. longa albido-puberula, bracteis sub floribus acuminatis ut eis basi inflorescentiae; pedicellis gracilibus sub anthesi 7-12 mm. longis ut rhachi puberulis, superne parce glanduloso-strigillosis, medium versus bibracteolatis, bracteolis ut bracteis sed 1.5-2 mm. longis; calyce sub anthesi 5-6 mm. longo et apice circiter 3 mm. diametro parce puberulo, tubo 5-angulato 3-3.5 mm. longo parce glanduloso-strigilloso, limbo erecto submembranaceo profunde 5-lobato, lobis elongato-deltoideis 1.5-2.5 mm. longis acutis, sinibus acutis; disco annulari glabro; corolla submembranacea urceolato-cylindrica sub anthesi 7-9 mm. longa et basim versus alis inclusis circiter 3 mm. diametro, superne angustata et pallide puberula, 5-alata, alis basim versus 0.6-1 mm. latis superne angustioribus, lobis deltoideo-lanceolatis circiter 2 mm. longis; staminibus 10, filamentis incon-

spicuis liberis ligulatis glabris circiter 1 mm. longis, antheris 6.5-7 mm. longis, thecis 1.5-1.8 mm. longis basi obscure mucronulatis, tubulis quam thecis triplo longioribus per rimas elongatas dehiscentibus; stylo filiformi corollam subaequante, stigmate minuto.

Santiago-Zamora: Cordillera Cutucú, east-trending slope from top of ridge down toward the Itzintza, 4,800-5,800 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1366* (TYPE US 1,989,018; dupl. NY) (high-growing epiphyte, a semi-vine; leaves dark green above, pale beneath). Same locality, ridge just south and west of Río Itzintza, 4,500 to 5,900 ft. elev., *Camp E-1330, E-1342* (high-growing epiphytes, brought down by storm; leaves shining on both sides).

The closest relative of the new species appears to be *T. schultzeae* Sleumer (Bot. Jahrb. 71: 393. 1941), which also occurs in the "Oriente" of Ecuador. From this, *T. cutucuensis* differs in its somewhat larger leaves and inflorescences, and especially in its larger calyx with elongate lobes and sharp sinuses, its winged corolla, and its differently proportioned anthers, of which the thecae are much shorter and the tubules proportionately longer. The occurrence of a winged corolla in *Themistoclesia* has otherwise been noted in the Colombian *T. pterota* A. C. Smith (Jour. Arnold Arb. 27: 103. 1946), which has broader and deeply cordate leaf-blades, a minutely denticulate calyx-limb, and a more strongly urceolate corolla.

***Themistoclesia campii* A. C. Smith, sp. nov.**

Frutex ad 1.5 m. altus, ramulis gracilibus subteretibus fusco-cinereis albidopuberulis vel fusco-hispidulis ac etiam squamis parvis irregularibus nigrescentibus leprosis, demum glabratibus; petiolis subteretibus 2-3 mm. longis primo minute hispidulis demum glabrescentibus; laminis subcoriaceis in sicco fuscis ovato-ellipticis, 2-3.7 cm. longis, 1-2 cm. latis, basi rotundatis vel subcordatis, ad apicem breviter acuminatum callosum gradatim angustatis, margine leviter incrassatis et recurvatis, supra pallide puberulis mox glabratibus, subtus squamis parvis nigris leprosis etiam praecipue costa parce fusco-hispidulis, costa supra leviter impressa subtus valde elevata, nervis lateralibus utrinsecus plerumque 2 e basi orientibus supra leviter impressis vel utrinque ut rete venularum immersis; inflorescentia axillari breviter racemosa 3-10-flora bracteis pluribus papyraceis ovatis subacutis 1-2 mm. longis basi circumdata, rhachi gracili 5-10 mm. longa pilis pallidis 0.2-0.3 mm. longis minute hispidula, bracteis sub floribus ut eis basi inflorescentiae; pedicellis gracilibus sub anthesi 7-11 mm. longis ut rhachi hispidulis etiam nigro-leprosis, medium versus bibracteolatis, bracteolis circiter 1.5 mm. longis; calyce sub anthesi circiter 5 mm. longo et apice 4 mm. diametro ut pedicello hispidulo et leproso, tubo circiter 3 mm. longo manifeste 5-angulato, limbo suberecto papyraceo intus glabro quam tubo brevior 5-lobato, lobis late deltoideis cuspidatis circiter 1 mm. longis, sinibus obtusis; disco annulari-pulvinato hispidulo; corolla carnosca subcylindrica sub anthesi 7.5-8 mm. longa, basim versus 3.5-4 mm. diametro supeme angustata, extus pilis stramineis circiter 0.5 mm. longis hispidula, lobis 5 deltoideis subacutis 1-1.5 mm. longis; staminibus 10 similibus quam corolla brevioribus, filamentis liberis gracilibus pallidis ligulatis circiter 2 mm. longis pilis paucis circiter 0.5 mm. longis hispidulis, antheris 4.5-5.5 mm. longis, thecis 1.5-2 mm. longis basi subacutis, tubulis quam thecis longioribus per rimas circiter 1 mm. longas dehiscentibus; stylo tereti corollam subaequante, stigmate minuto.

Azuay: "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), 11,000-11,350 ft. elev., Dec. 17, 1944, *Camp E-1640* (TYPE US 1,989,027; dupl. NY) (east of El Pan; shrub 0.5 m. high, terrestrial; leaves deep green above, pale

beneath; hypanthium green; corolla salmon-pink in bud, becoming red at anthesis). Same locality, *Camp E-4865* (NY only) (shrub to 1.5 m.; leaves crisp-coriaceous, deep green, nitid above, pale beneath, cusped, even the youngest with a black scurf; corolla dull crimson, the lobes yellow).

*Themistoclesia campii* is most readily characterized by the blackish scurfy scales which persist on the lower surfaces of leaves and on the inflorescence, and by its hispidulous corolla. From the Colombian *T. compacta* A. C. Smith it is distinguished not only by the different character of its foliar indument, but also by the shorter and sparser pubescence of its inflorescence (especially the corolla), its longer pedicels, and its isomorphic stamens with essentially glabrous filaments. From *T. dependens* (Benth.) A. C. Smith the new species is readily distinguished by its indument and its short stamens.

Not included in the above description, but almost certainly referable to this species, is *Camp E-751* (NY only) (Azuay: same locality, 9,000-11,000 ft. elev.; spreading shrub with deep red flowers), which differs only as follows: corolla at anthesis 10-11 mm. long and hispidulous only at apex; filaments about 2.5 mm. long, glabrous; anthers about 7 mm. long, the thecae about 2.5 mm. long. Except for the slightly larger and essentially glabrous corolla and stamens, this specimen agrees perfectly with the two described; it apparently represents a form of the species occurring at somewhat lower elevation. When the full range of variability is known, no. 751 will doubtless fit into a reasonable species concept.

*Themistoclesia dependens* (Benth.) A. C. Smith, Contr. U. S. Nat. Herb. 28: 442. 1932.

Azuay: "Oriente" Border, Eastern Cordillera, between Oña and the Río Yacumbi, east slope, 8,000-9,500 ft. elev., *F. Prieto P-270* (shrub to 3 m.; young leaves pale, the old leaves of previous season deep green and subnitid above, pale green and dull beneath; corolla bright crimson, with pale pink lobes).

A fairly frequent species in western Colombia and Ecuador, also represented from Azuay by *Steyermark 53446* (A, Ch).

*Sphryospermum buxifolium* Poepp. & Endl. Nov. Gen. & Sp. 1: 4. pl. 8. 1835.

Guayas, Cañar, Chimborazo, & Bolivar junction: Foothills of the western cordillera near the village of Bucay, *Camp E-3833* (NY only). El Oro: In Moro-Moro region, about 21 miles west of Portovelo, *Camp E-632, E-634* (both NY only). Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, near El Topo, *Camp E-1686, E-1688* (NY only), *E-1689, E-1691* (NY only); same general region, east of Puyo, *Camp E-1698* (NY only). Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza, El Partidero, between the Ríos Paute and Negro, *Camp E-1520* (NY only). Low hills west of Río Upano, along Río Chupiangas, *F. Prieto ChuP-18*. Cordillera Cutucú, *Camp E-1181, E-1202, E-1341, E-1361* (all NY only).

Field notes accompanying this excellent suite of specimens indicate that the plant is a slender epiphyte, often pendant and high-climbing, rarely scrambling or trailing along banks, and in one case (no. 634) terrestrial and suberect to 50 cm. high; it occurs in forest at elevations of 2,100 to 5,900 ft.; the corolla is white and sometimes pink-tinged; the mature fruit is light blue or pale bluish lavender, sometimes subtranslucent, and insipid.

The related *S. majus* Griseb. was mentioned in my revision (*Brittonia* 1: 209. 1933) as having a southern limit of Venezuela, but I have since seen several specimens from Colombian Departments as far south as El Valle and Cundinamarca. However, at least in its typical form, the species does not seem to occur in Ecuador, although some of the cited specimens (e. g. those from the Cordillera

Cutucú) approach it in their comparatively large ovate leaves. The value of *S. majus* as a specific entity at any rate is open to question, and I think it advisable to refer all the small-leaved Ecuadorian specimens with 4 or 5 stamens to *S. buxifolium*.

*Sphyraspermum flaviflorum* A. C. Smith, sp. nov.

Frutex epiphyticus, ramulis gracilibus teretibus cinereis ad nodos incrassatis juventute albido-puberulis mox glabratis; foliis congestis, petiolis subteretibus 1-2 mm. longis ut ramulis mox glabratis; laminis in sicco coriaceis fusco-olivaceis ellipticis, 15-22 mm. longis, 10-15 mm. latis, basi et apice rotundatis, margine incrassatis paulo recurvatis, subtus minutissime et subpersisterenter albido-puberulis ac etiam dispersim glanduloso-strigillosis (pilis castaneis circiter 0.2 mm. longis caducis), e basi obscure 3- vel 5-nerviis, costa supra leviter impressa subtus elevata, nervis lateralibus obscuris; floribus axillaribus solitariis basi bracteis pluribus minutis imbricatis suffultis, rhachi subnulla; pedicellis gracilibus 2.5-3.5 mm. longis pilis 0.3-0.6 mm. longis albido-hispidulis basi minute bibracteolatis cum calyce continuis; calyce sub anthesi 3.5-4 mm. longo et apice diametro ut pedicellis hispidulo, tubo cupuliformi circiter 2 mm. longo, limbo erecto-patente profunde 5-lobato, lobis elongato-deltaideis circiter 1.5 mm. longis acutis intus glabris, sinibus obtusis vel rotundatis; disco annulari-pulvinato glabro; corolla subcarnosa extus parce hispidula campanulata, sub anthesi circiter 5.5 mm. longa et apice 4 mm. diametro, lobis 5 late deltaideis circiter 0.5 mm. longis subacutis; staminibus 10 alternatim leviter inaequalibus quam corolla brevioribus, filamentis gracilibus ligulatis glabris circiter 1.5 mm. longis, antheris 2.7-3 mm. longis, thecis 1-1.2 mm. longis, tubulis longioribus per poros subterminales circiter 0.2 mm. longos dehiscentibus; stylo filiformi corollam subaequante, stigmate minuto.

Cañar: Valley of Río de Cañar, near Rosario, 3,400 ft. elev., Sept. 6-10, 1944, F. Prieto CP-16 (TYPE US 1,988,906; dupl. NY) (epiphyte; leaves succulent; corolla yellowish, tinged with pink if exposed to sun).

*Sphyraspermum flaviflorum* belongs to a small group of Ecuadorian species not discussed in my revision of 1933, but treated in Sleumer's more recent key (Bot. Jahrb. 71: 394, 395. 1941). The two species thus far comprising the group are characterized by having stamens twice as many as corolla-lobes, very short pedicels, small flowers, and anthers with slender tubules dehiscing by subterminal pores. The new species differs from *S. spruceanum* Sleumer in its larger and obscurely pilose leaves and its obviously pedicellate flowers, which are larger in all parts. From the related *S. microphyllum* Sleumer, it is distinguished by its much larger leaves and flowers, its comparatively conspicuous calyx-lobes, and its campanulate (rather than apically contracted) corollas.

*Sphyraspermum campii* A. C. Smith, sp. nov.

Frutex epiphyticus vel terrestris, ramulis gracillimis brunneis minute et subpersisterenter pallido-puberulis; petiolis gracilibus teretibus 1-2 mm. longis ut ramulis puberulis; laminis in sicco subcoriaceis fuscis ovatis, 15-26 mm. longis, 10-15 mm. latis, basi late obtusis vel subrotundatis, apice subacutis, margine leviter recurvatis, subtus evanescenter puberulis ac etiam dispersim glanduloso-strigillosis, e basi obscure 3- vel 5-nerviis, costa supra plana vel paulo impressa subtus subelevata, nervis aliis immersis; floribus axillaribus solitariis; pedicellis gracilibus sub anthesi 1.5-2 mm. longis parce puberulis cum calyce continuis basi bracteis paucis minutis suffultis, basim versus bibracteolatis, bracteolis reniformi-orbiculatis haud 1 mm. latis; calyce sub anthesi circiter 3 mm. longo et apice diametro pilis pallidis 0.3-0.5 mm. longis copiose hispidulo etiam obscure castaneo-glanduloso, tubo subgloboso circiter 1.5 mm. longo, limbo papyraceo suberecto

4-lobato intus glabro, lobis late deltoideis 0.5-1 mm. longis subacutis, sinibus rotundatis vel late obtusis; disco annulari-pulvinato glabro; corolla subcarnosa late campanulata sub anthesi 8-9.5 mm. longa, basi angustata, apice circiter 6 mm. diametro, glabra, lobis 4 deltoideis subacutis circiter 1.5 mm. longis et 3-4 mm. latis; staminibus 8 similibus quam corolla brevioribus, filamentis ligulatis 2-2.5 mm. longis superne copiose pallido-hispidulis, antheris 3.5-3.8 mm. longis, thecis crassis basi obtusis longitudine tubulos aequantibus, tubulis gracilibus per poros subterminales dehiscentibus; stylo filiformi quam corolla brevior, stigmate truncato.

El Oro: In Moro-Moro region, about 21 miles west of Portovelo, 3,400-4,200 ft. elev., Oct. 7, 1944, *Camp E-633* (TYPE US 1,988,987; dupl. NY) (in dense rain-forest, seen both as epiphyte and on soil on steep banks; when on banks, the flowering branches ascending to 10-15 cm.; corolla deep red; fruit angled, greenish white, translucent when mature, 0.75-1 cm. in diameter).

The species here described seems best placed as a relative of the three species discussed immediately above, differing from all of them in its ovate and subacute leaf-blades and large corollas. In leaf-size it most closely approximates *S. flaviflorum*, described above, but the 4-merous flowers, comparatively small calyx-lobes, glabrous corollas, and differently proportioned anthers further distinguish it.

The mention in Dr. Camp's field notes of an angled fruit may suggest that the new species would be better placed in *Themistoclesia*, in which it bears a superficial resemblance to *T. cuatrecasasii* A. C. Sm. However, the calyx-tube in flower appears essentially globose, as in *Sphyrospermum*, and the habit of the plant certainly suggests this genus. The campanulate corollas and nearly terminal anther-pores are known to occur in *Sphyrospermum*, but not in *Themistoclesia*. A close approach of the two genera, however, is here indicated.

***Sphyrospermum cordifolium* Benth. Pl. Hartw. 222. 1846.**

Pichincha: Along the road from Quito to Sto. Domingo de los Colorados, *Camp E-1734*. Azuay: The eastern Cordillera, vicinity of the village of Sevilla de Oro and 1-8 km. northward, *Camp E-4442* (NY only), *E-4560*, *E-4740*, s. n. (July-Sept. 1945) (NY only). El Oro: In Moro-Moro region, about 21 miles west of Portovelo, *Camp E-631* (NY only). Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, *Camp E-77*. Hda. Anganuma, at headwaters of Río Cachiyacu, on west slopes of Cordillera Condor, about 46 km. south of Loja, *Jorgensen & Prieto PJ-50B* (NY only). Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza, region of Tambo Consuelo, *Camp E-1602* (NY only).

The cited specimens were collected at elevations of 3,400 to 10,000 ft.; the plant is usually an epiphytic vine, but sometimes terrestrial with branches hanging over rocks; leaves crisp-coriaceous, deep green above and paler beneath; corolla white to pinkish or crimson (in plants not otherwise distinguishable); fruit pale blue, translucent.

These collections are fairly diverse, but I expect that the range of variation which I previously indicated (*Brittonia* 1: 213, 214. 1933) is not exceeded; degree of floral pubescence and size of corolla seem to be unstable in this species, and flower-color also seems unreliable. The most extreme of the cited specimens is no. 1734, which perhaps ought to be excluded from the species; it is a shrub 1 m. high, with very short (5-7 mm.) pedicels and small, essentially glabrous flowers. Such short pedicels are found in *S. sodiroi* (Hoer.) A. C. Smith, also from the Province of Pichincha, but in that species the flowers are densely villose, with comparatively large corollas and long filaments. *Sphyrospermum sodiroi* is recorded (*Haught* 3228a, US) as abundant along the Quito-Santo Domingo road, the

precise locality of Camp's no. 1734, indicating the possibility that the two species hybridize in this region, if, indeed, *S. sodiroi* is more than a very extreme form of *S. cordifolium*.

#### *Spherospermum* sp.

Santiago-Zamora: Valley of the Río Zamora, east of Loja, near Zamora, about 3,000 ft. elev., Camp E-16 (epiphyte, over river; fruit pale blue).

This fruiting specimen represents a species not otherwise in Dr. Camp's material. In the texture and general shape of its leaves it suggests the Peruvian *S. weberbaueri* (Hoer.) A. C. Smith, but it differs in the leaf-blades with rounded-obtuse apices and in the short-pedicellate fruits. I think it probable that the specimen represents an undescribed species.

#### *Eleutherostemon* Herzog.

A note on this little genus and a discussion of the eight species now known to compose it have recently been published by the writer (Contr. U. S. Nat. Herb. 29: 350-355. 1950). Collections of *Eleutherostemon* are still rare, and consequently the eight numbers of it obtained by Dr. Camp are very welcome. The only previous records of the genus in Ecuador refer to *E. amplexens* (Sleumer) A. C. Smith and *E. octandrum* (Sleumer) A. C. Smith (as *Diogenesia octandra* Sleumer, Bot. Jahrb. 71: 396. 1941), and it is possible that the latter record is referable to one of the species I describe below as new. *Eleutherostemon amplexens* is not among Dr. Camp's collections, all of which, in my opinion, represent undescribed species.

#### *Eleutherostemon floribundum* A. C. Smith, sp. nov.

Fruetex interdum epiphyticus multiramosus, ramulis fusco-cinereis obtuse angulatis juventute minute puberulis mox glabratis; stipulis inconspicuis circiter 1 mm. longis basi pulvinatis acutis; petiolis semiteretibus 1.5-3 mm. longis supra subpuberulis; lamina papyraceis in sicco fuscis lanceolatis, 5-10 cm. longis, 1.3-3 cm. latis, basi acutis vel obtusis, in apicem gracilem ad 15 mm. longum mucronulatum gradatim angustatis, margine leviter recurvatis, supra glabris, subtus minute et dispersim glanduloso-strigillosis veleglandulosis, costa supra insculpta subtus valde elevata, nervis secundariis utrinsecus plerumque 2 adscendentibus inconspicuis subtus leviter prominulis, rete venularum immerso vel subtus haud prominulo; inflorescentia axillari breviter racemosa 4-8-flora bracteis numerosis ovatis acutis 1-2 mm. longis basi circumdata, rhachi gracili 3-5 mm. longa minute puberula mox glabrata, bracteis floriferis eis basi rhachis similibus caducis; pedicellis gracilibus sub anthesi et fructu juvenili 9-13 mm. longis ut rhachi minute puberulis et superne parce glandulosis medium versus bibracteolatis, bracteolis lanceolatis 1-1.5 mm. longis caducis; calyce cupuliformi sub anthesi 2.5-3 mm. longo et diametro obscure puberulo glabrato, limbo subcoriaceo erecto minute 4-denticulato (dentibus haud 0.3 mm. longis), sinibus complanatis; disco conspicuo carnosio cylindrico circiter 0.7 mm. alto glabro; corolla tenuiter carnosia cylindrico-subcampanulata, sub anthesi 5-6 mm. longa glabra conspicue 4-lobata, lobis elongato-deltaeideis circiter 2 mm. longis et 1.5 mm. latis acutis reflexis distaliter intus obscure papillois; staminibus 5 corollam subaequantibus, filamentis ligulatis liberis 3-3.5 mm. longis ubique copiose breviter pilosis, antheris circiter 3 mm. longis basi obtusis, thecis quam tubulis per rimas 0.6-0.8 mm. longas dehiscentibus paullo longioribus; stylo crasso tereti leviter exserto basi disco arcte cincto, stigmatibus minuto; fructibus immaturis ellipsoideis leviter quadrangulatis calycis limbo et disco persistentibus coronatis.

Azuay: "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez),

9,000–11,000 ft. elev., Oct. 30, 1944, *Camp E-706* (TYPE US 1,988,992; dupl. NY) (shrub 1.5 m.; flowers white). Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Hda. Chontal and Sta. Elena, 3,400–4,600 ft. elev., *Camp E-792* (epiphytic shrub to 3 m.); same locality, between Tambo Chontal and Tambo Consuelo, 5,700–8,000 ft. elev., *Camp E-1572* (much-branched epiphyte, in clumps; leaves dark above, paler beneath, shining; fruit globular, pale).

In foliage and in calycine characters *E. floribundum* suggests *E. octandrum* (Sleumer) A. C. Smith, from which it differs in its more compact and fewer-flowered inflorescences, conspicuous cylindrical disk (scarcely 0.2 mm. high in *E. octandrum*), slightly shorter corolla, and reduced number of stamens, with longer and copiously pilose filaments. From *E. tetrandrum* A. C. Smith, which similarly has a reduced number of stamens and a conspicuous disk, the new species differs in its proportionately narrower leaf-blades, its inflorescence with a shorter rachis but longer pedicels, shorter and more deeply lobed corolla, and stamens with shorter filaments and longer anthers. So far as observed at present, the stamens are uniformly 4 in *E. tetrandrum* and 5 in *E. floribundum*.

*Eleutherostemon oliganthum* A. C. Smith, sp. nov.

Frutex interdum epiphyticus, ramulis gracilibus obtuse angulatis juventute minute puberulis mox glabratis; stipulis obscuris pulvinatis; petiolis subteretibus rugulosis 1–2 mm. longis obscure puberulis glabrescentibus; laminis papyraceis in sicco fuscis ovato-lanceolatis, (4–)5–12 cm. longis, (1.5–)1.8–4 cm. latis, basi late obtusis vel rotundatis vel inconspicue subcordatis, in acuminem ad 2 cm. longum (apice ipso obtuso) angustatis, margine anguste recurvatis, utrinque glabris (juvenilibus basim versus puberulis) vel subtus dispersim et sparsissime glanduloso-strigillosis, costa superne impressa subtus elevata, nervis secundariis utrinsecus 2 vel 3 basim versus orientibus (intimis cum costa ad 2 cm. concurrentibus) adscendentibus supra insculptis vel prominulis subtus paullo elevatis, rete venularum supra subplano subtus prominulo; floribus axillaribus solitariis, bracteis basalibus minutis; pedicellis gracillimis parce puberulis sub anthesi 10–13 mm. longis basim versus minute bibracteolatis; calyce sub anthesi 2.5–3.5 mm. longo et 2–3 mm. diametro pilis pallidis circiter 0.2 mm. longis copiose hispidulo ac etiam obscure rubro-glanduloso demum subglabrescente, tubo cupuliformi 1.5–2 mm. longo, limbo subpatente quam tubo leviter brevior minute 5-dentato (dentibus circiter 0.5 mm. longis), sinibus rotundatis; disco carnoso annulari-pulvinato glabro; corolla tenuiter carnosa cylindrica sub anthesi 10–11 mm. longa et circiter 3.5 mm. diametro glabra, lobis 5 deltoideis obtusis haud 1 mm. longis; staminibus 10 quam corolla paullo brevioribus, filamentis gracilibus ligulatis 5–6 mm. longis superne parce hispidulis, antheris 3.5–4 mm. longis, thecis 1.2–1.4 mm. longis basi rotundatis vel obscure mucronulatis, tubulis quam thecis longioribus per rimas elongatas dehiscentibus; stylo leviter exserto filiformi, stigmatate minute peltato.

Santiago-Zamora: Cordillera Cutucú, along narrow flood-plain of Río Itzintza, 3,500–3,700 ft. elev., Nov. 17–Dec. 5, 1944, *Camp E-1230* (TYPE NY) (epiphytic; leaves shining; corolla crimson); ridge ascending into central Cutucú, 4,400–4,700 ft. elev., *Camp E-1158* (NY only) (shrub; leaves shining beneath; corolla red); on banks of Río Itzintza, 3,500 ft. elev., *Camp E-1205* (NY only) (epiphyte, flowering on old wood among the roots; leaves deep green and dull above, pale and shining beneath; corolla bright crimson).

*Eleutherostemon oliganthum* is characterized by its solitary flowers and elongate filaments, being readily distinguished from *E. octandrum* (Sleumer) A. C. Smith, apparently its closest relative, by these characters and by its pilose calyx, longer corolla, and more numerous stamens.



The following specimen probably also belongs here: Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, on cliff-top, near El Topo, 4,400 ft. elev., *Camp E-1687* (plants scrambling from mossy bank, or sometimes epiphytic; fruit solitary, immature, subglobose, about 8 mm. in diameter). It agrees with *E. oliganthum* in length of pedicel, pubescence of calyx, and the comparatively inconspicuous disk; however, its leaves are slightly different in shape and venation, and I hesitate to make a positive identification of it without flowers.

*Eleutherostemon gracilipes* A. C. Smith, sp. nov.

Frutex praeter flores ubique glaber, ramulis gracilibus obtuse angulatis; stipulis obscuris coriaceis pulvinatis haud 1 mm. longis; petiolis subteretibus rugulosis 1-2 mm. longis; laminis papyraceis in sicco fuscis lanceolatis vel ovato-lanceolatis, 7-11 cm. longis, 1.5-5 cm. latis, basi late obtusis vel rotundatis, in acuminem gracilem obtusum ad 2 cm. longum gradatim angustatis, margine paullo recurvatis, subtus minute et dispersim glanduloso-strigillosis, basim versus 5-nerviis, costa et nervis secundariis (intimis cum costa ad 2 cm. concurrentibus) adscendentibus supra leviter impressis subtus elevatis, rete venularum supra plerumque immerso subtus prominulo; floribus axillaribus ut videtur solitariis, bracteis basalibus paucis obscuris; pedicellis gracillimis sub anthesi 20-30 mm. longis minute albidopuberulis basim versus minute bibracteolatis superne obscure glandulosis; calyce sub anthesi 4.5-5 mm. longo et apice diametro albidopuberulo, tubo cupuliformi 2.5-3 mm. longo basim versus obscure rubro-glanduloso, limbo erecto-patente submembranaceo circiter 2 mm. longo minute 5-dentato (dentibus apiculatis circiter 0.5 mm. longis), sinibus complanatis; disco annulari-pulvinato carnosus glabro; corolla tenuiter carnosae glabra anguste cylindrico-campanulata sub anthesi 20-22 mm. longa, basim versus circiter 4 mm. superne 7-8 mm. diametro, lobis 5 reflexis obtusis circiter 4 x 3 mm.; staminibus 10 longitudine corollam fere aequantibus, filamentis liberis membranaceis ligulatis circiter 13 mm. longis utrinque villosopuberulis (pilis circiter 0.3 mm. longis), antheris 7-7.5 mm. longis, thecis levibus circiter 2.5 mm. longis basi rotundatis, tubulis 5-5.5 mm. longis per rimas ovales 1-1.5 mm. longas dehiscentibus; stylo filiformi corollam subaequante, stigmate minuto.

Santiago-Zamora: Eastern slopes of the cordillera, valley of the Río Negro, junction of Ríos Pailas and Negro (on the trail to Mendez), 6,000-7,500 ft. elev., Aug. 20-24, 1945, *Camp E-4924* (coll. F. Prieto) (TYPE US 1,989,113; dupl. NY) (shrub 3 m.; leaves deep green above, bright green and subnitid beneath).

*Eleutherostemon gracilipes* is immediately distinguished from its congeners by its comparatively long pedicels and corollas and its greatly elongated filaments. In its solitary flowers and puberulent calyx it suggests the preceding new species (*E. oliganthum*), but in floral dimensions the two are very distinct.

*Disterigma alaternoides* (H. B. K.) Nied. Bot. Jahrb. 11: 224. 1889.

Cañar: Northeast of Azogues, *Camp E-1784*, F. Prieto P-90. Azuay: Ridge between El Pan and Guachapala, *Camp E-5256*. North of Paute, *Camp E-2594*. The eastern Cordillera, north of Sevilla de Oro, *Camp E-4271*. "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), *Camp E-720*. Loja: Loma de Oro, near Saraguro, *Camp E-558* (NY only), *E-692*. Nudo de Guagrauma, slopes of the Loma de Oro, *Camp E-274* (NY only). Cerro Villanaco, west of Loja, *Camp E-249*, *E-250*. "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, *Camp E-74*, *E-90*. Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, vicinity of El Topo, *Camp E-1684*, *E-1685*, *E-1690* (NY only), *E-2410* (NY only). Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza, Tambo Chontal to Tambo Consuelo, *Camp E-1595* (NY only).

The cited specimens were obtained at altitudes of 4,000 to 11,000 ft., the plant having been noted most often as a shrub, low and spreading in exposed places but up to 4 m. high where protected from winds; it is sometimes epiphytic, either dependent or with erect stiff branches; leaves deep green above, paler beneath, often nitid; corolla white to pink; mature fruit about 1 cm. in diameter, white or pinkish to reddish purple or wine-red, translucent.

This excellent series of specimens, together with many others which have become available since my previous discussion of the species (*Brittonia* 1: 219, 220. 1933), show that *D. alaternoides* varies to such a degree that the variety *parvifolium* (Benth.) A. C. Smith no longer has any significance. This variety occurs throughout the range of the species (Venezuela to Bolivia) and is distinguishable only on the basis of its smaller than typical leaves. It is now seen that leaves on different branches of the same plant are often quite diverse in size, their dimensions perhaps depending largely upon age or exposure. Although I originally noted the flowers as "glabrous," it should be noted that some of the specimens now available have both calyx and corolla sparsely pilose with minute whitish hairs.

*Disterigma leucanthum* A. C. Smith, sp. nov.

Frutex epiphyticus vel muscicola, ramulis gracilibus obtuse angulatis juventute minute puberulis demum glabratibus; petiolis subteretibus rugulosis 1.5-2.5 mm. longis ut ramulis puberulis; laminis subcoriaceis in sicco fusco-viridibus ellipticis, 15-22 mm. longis, 8-15 mm. latis, basi rotundatis vel late obtusis, apice late obtusis, margine leviter recurvatis, juvenilibus parce puberulis mox glabratibus, subtus parce et subsistententer rubro-glanduloso-strigillosis, e basi obscure 5-nerviis, costa et nervis secundariis supra prominulis subtus obscuris vel leviter elevatis, rete venularum supra saepe prominulo subtus immerso; inflorescentia uniflora bracteis inconspicuis pluribus papyraceis imbricatis suborbiculari-oblongis parce ciliolatis (maximis circiter 1.5 mm. longis) basi circumdata; pedicellis bracteolis calyce et corolla extus dense et uniformiter puberulis (pilis pallidis patentibus circiter 0.1 mm. longis); pedicellis teretibus 1-2 mm. longis, bracteolis apicalibus late ovato-reniformibus circiter 1 mm. longis et 3 mm. latis ciliolato-marginatis imbricatis quam calycis tubo brevioribus; calyce sub anthesi circiter 5 mm. longo et apice diametro, tubo obscure angulato circiter 1.5 mm. longo, limbo erecto-patente profunde 4-lobato, lobis ovatis 2.5-3 mm. longis latisque interdum basi anguste imbricatis apice obtusis intus glabris; disco annulari-pulvinato glabro; corolla carnosa cylindrica sub anthesi circiter 9 mm. longa et 3.5 mm. diametro intus glabra, lobis 4 oblongis circiter 2 mm. longis obtusis; staminibus 8 quam corolla brevioribus, filamentis gracilibus liberis ligulatis 2-2.5 mm. longis superne intus parce villosis, antheris 4.5-5 mm. longis, thecis basi rotundatis parce hispидulis, tubulis thecas longitudine subaequantibus per rimas ovas 0.5-1 mm. longas dehiscentibus; stylo crasso tereti corollam subaequante, stigmatibus minutis.

Santiago-Zamora: Cordillera Cutucú, ridge just south and west of Río Itzintza, 5,000-5,900 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1344* (TYPE US 1,989,017; dupl. NY) (epiphyte, or at 5,900 ft. seen growing in a mound of sphagnum; corolla pure white).

The new species is a relative of *D. alaternoides* (H. B. K.) Nied., differing in its very short pedicellary bracteoles which do not effectively conceal the calyx-tube (as they do in *D. alaternoides*, where they are usually 2-4 mm. long), its copiously and uniformly puberulent flowers (glabrous or very sparsely pilose in *D. alaternoides*), its large calyx-lobes (1.2 mm. long in *D. alaternoides*), and its longer corolla and anthers. Other species of this general alliance, *D. popenoei* Blake and *D. ulei* Sleumer, differ from the new species in many obvious characters,

the first having conspicuously nerved leaves, several-flowered inflorescences, a glabrous short-lobed calyx, and small anthers, the second having thick-carnose obovate leaves and very small flowers (calyx teeth minute; corolla about 3.5 mm. long, glabrous; anthers about 2 mm. long).

*Disterigma empetrifolium* (H. B. K.) Drude in E. & P. Nat. Pfl. 4 (1): 52. 1889.

Cañar: Uplands called "Huairacaja," 10-20 km. northeast of Azogues, *Camp E-1777*. Azuay: Along the Río Matadero, west of Cuenca, *Camp E-2021*. Vicinity of the lake in the valley of the Río Surucuchu (a branch of the Río Matadero), 18-20 km. west of Cuenca, *Camp E-4162*. Páramo de Tinajillas and surrounding chaparral and forests, 30-50 km. south of Cuenca, *Camp E-467*. "Oriente" Border, Eastern Cordillera, between Oña and the Río Yacuambi, *F. Prieto P-303*. Loja: Cerro Villanaco, about 7 km. west of the city of Loja, *Camp E-247*.

The species was often common where noted, at elevations of 8,000 to 11,200 ft., growing as a low shrub in grass, among rocks, on banks, or in bogs, often forming mats or dense clumps and propagating by runners; leaves dark green above, paler beneath, dull on both sides or shining above; corolla light rose or deep pink to crimson; filaments white, the anthers red-brown; mature fruit white, translucent, oblate-spherical, up to 1 cm. in diameter, insipid.

This is the common small-leaved species of *Disterigma*, occurring along the Andes from Venezuela to Peru.

*Disterigma codonanthum* Blake, Jour. Wash. Acad. 16: 363. 1926.

Azuay: Cordillera de Alpachaca (headwaters of the Río Jubones, between the Ríos Giron and León), near the pan-American highway at about km. 79, *Camp E-405*. The eastern Cordillera, 4-6 km. north of the village of Sevilla de Oro, *Camp E-4717A*, *E-4717B*. "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), *Camp E-4869* (NY only); same locality, east of El Pan, *Camp E-1632*.

The cited specimens were obtained at elevations of 9,000 to 11,350 ft.; they were collected at the edges of páramos and sometimes formed the dominant ground-cover on open slopes and páramo areas; in habit these plants often occur in dense mats in sphagnum meadows, propagating by long runners, sometimes almost buried in the sphagnum with only the tips exposed, or with the aerial parts stiffly erect and rarely as high as 0.5 m.; leaves shining, deep green above, paler beneath; bracts and calyx bright green; corolla green, red-tinged, brick-red, or rosy-pink (total range of color variation from green to red sometimes found in single plants); filaments white to bright pink, the anthers brown; fruit white, translucent.

This species, apparently endemic to Ecuador, is less rare than indicated by the fact that I cited only two collections in 1933 (*Brittonia* 1: 228); I have since seen material from Carchi (*Penland & Summers* 871, NY), Imbabura (*Penland & Summers* 818, NY), and Azuay (*Steyermark* 53436, A, Ch). Some of the corollas on the Camp specimens are larger than previously noted, being up to 10 mm. long. Number 4869 has leaf-blades notably larger than usual (up to 10 × 5 mm.), but its flowers are typical for the species. Number 1632, from the same general locality, has one similarly large-leaved branch, from which arise lateral shoots with leaves normal for the species (1.5-3 mm. broad). These interesting specimens show what variable and undependable characters the shape and size of leaves are in this complex.

*Disterigma campii* A. C. Smith, sp. nov.

Frutex epiphyticus, ramulis elongatis gracilibus fusco-castaneis obtuse angulatis vel subteretibus copiose hispidulis (pilis castaneis circiter 1 mm. longis subsistentibus); foliis non confertis 4 vel 5 per centimetrum; petiolis teretibus

gracilibus circiter 1 mm. longis parce breviter hispidulis; laminis papyraceis in sicco supra olivaceis subtus fuscis oblongo-ellipticis, (10-)12-15 mm. longis, (3-)5-8 mm. latis, basi obtuse cuneatis, apice obtusis vel rotundatis, margine recurvatis, utrinque glabris vel subtus raro obscure glandulosis secus costam, e basi obscure 5-nerviis, costa supra leviter impressa subtus elevata, nervis aliis immersis; floribus solitariis axillaribus subsessilibus praeter calycis lobos et filamentas glabris, bracteis basalibus paucis papyraceis suborbicularibus maximis haud 1.5 mm. diametro; pedicellis gracilibus circiter 0.5 mm. longis, bracteolis apicalibus papyraceis suborbicularibus 3-3.5 mm. longis et latis rotundatis calycis tubum amplectentibus; calyce sub anthesi circiter 5 mm. longo et apice diametro, tubo cupuliformi circiter 2 mm. longo, limbo erecto-patente papyraceo profunde 4-lobato, lobis oblongo-deltaideis 2.5-3 mm. longis 2-2.5 mm. latis apice incrassatis subacutis minute hispidulis; disco annulari-pulvinato; corolla tenuiter carnosam late campanulata etiam subrotata 5-6 mm. longa apice 7-8 mm. diametro profunde 4-lobata, lobis deltaideis 3.5-4 mm. longis et basi circiter 3 mm. latis valde reflexis apice obtusis; staminibus 8 quam corolla brevioribus, filamentis ligulatis gracilibus liberis circiter 1.5 mm. longis superne parce hispidulis, antheris 3-3.5 mm. longis, thecis basi rotundatis, tubulis gracilibus quam thecis brevioribus per rimas ovales circiter 0.5 mm. longas dehiscentibus; stylo crasso tereti leviter exserto, stigmate minuto.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, near junction of El Tigre and Pastaza, below Topo, 5,600 ft. elev., May 9, 1944, *Camp E-1692* (TYPE US 1,989,039; dupl. NY) (epiphyte, blown from tree-top; terminal new growth in bud notably mucilaginous; flowers white; fruit white, translucent).

The very distinct new species here described is characterized by its lax habit, elongate branchlets with a persistent hispidulous indument, well-spaced leaves of average size for the genus, solitary subsessile flowers, and especially by its broadly campanulate or even subrotate corollas. In size and shape of leaves it approximates *D. humboldtii* (Kl.) Nied. (Guatemala to Venezuela and Colombia), but that species has shorter calyx-lobes, a cylindrical corolla, comparatively long filaments, and anthers with proportionately longer tubules. In floral characters the new species seems closest to *D. codonanthum* Blake, and its leaves (although still considerably larger) are even suggestive of the large-leaved phase of that species, discussed above. However, *D. campii* also differs from *D. codonanthum* in its branchlet-indument, shorter pedicels, shorter and even more broadly campanulate corollas, and short filaments.

*Disterigma micranthum* A. C. Smith, sp. nov.

Frutex nanus, ramulis primo brunneis obtuse angulatis laxe pilosis (pilis circiter 1 mm. longis) demum cinerascentibus teretibus glabris, ramulis brevibus bracteis papyraceis imbricatis lanceolato-oblongis (maximis circiter 6 mm. longis) basi circumdati; foliis non confertis 3 vel 4 per centimetrum; petiolis gracilibus subteretibus circiter 1 mm. longis parce puberulis; laminis papyraceis in sicco pallide olivaceis anguste ellipticis, 8-10 mm. longis, 3-4.5 mm. latis, basi et apice obtusis, margine subplanis, interdum apicem versus obscure puberulis et subtus parce glanduloso-strigillosis, e basi obscure 3- vel 5-nerviis, costa nervisque immersis vel subtus leviter prominulis; floribus solitariis axillaribus subsessilibus praeter filamentas glabris, bracteis basalibus paucis suborbicularibus maximis haud 1 mm. diametro; pedicellis gracilibus haud 1 mm. longis, bracteolis apicalibus papyraceis suborbicularibus 2.5-3 mm. diametro scarioso-marginatis basi imbricatis calycis tubum amplectentibus; calyce sub anthesi 2.5-3 mm. longo et apice diametro, tubo obtuse angulato circiter 1.5 mm. longo, limbo erecto-patente 4-lobato, lobis deltaideis circiter 1 x 1.5 mm. subacutis; disco annulari-pulvinato;

corolla tenuiter carnosae urceolata sub anthesi 3.5-4 mm. longa et 2.5-3 mm. diametro basi et faucibus contracta, lobis 4 oblongis circiter 1 mm. longis subacutis; staminibus 8 quam corolla brevioribus, filamentis gracilibus liberis circiter 2 mm. longis superne villosis (pilis albidis circiter 0.4 mm. longis), antheris circiter 1.4 mm. longis, thecis basi rotundatis, tubulis gracilibus thecas subaequantibus per rimas ovals circiter 0.5 mm. longas dehiscentibus; stylo tereti corollam subaequante, stigmatе minuto.

El Oro: In Moro-Moro region, about 21 miles west of Portovelo, 3,400-4,200 ft. elev., Oct. 7, 1944, *Camp E-616* (TYPE NY) (in dense rain-forest, on banks; flowers white).

This new species is without close allies, being characterized by its very small flowers with urceolate corollas. In foliage it may most nearly suggest *D. humboldtii* (Kl.) Nied. and *D. campii* (described above), but the size and shape of the corolla and the minute anthers of *D. micranthum* make detailed comparisons superfluous.

#### *Disterigma* sp.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, low hills east of Puyo, 3,000 ft. elev., *Camp E-1699, E-1700* (both NY only) (epiphytes; fruit subtranslucent).

The cited specimens represent another species of *Disterigma* with a lax habit, leaves comparatively spaced on the branchlets, and subsessile solitary flowers. They closely resemble the preceding new species (*D. micranthum*) in foliage, but the calyx-lobes are comparatively elongate (about 2 mm. long) and hispidulous-ciliolate on the margins; the leaves also are persistently ciliolate-margined. Although I feel certain that these two collections represent an undescribed species, in the absence of corollas I think it best to await more complete material.

*Disterigma acuminatum* (H. B. K.) Nied. Bot. Jahrb. 11: 209. 1889.

Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, *Camp E-1729* (NY only). Azuay: Páramo and subpáramo area north and northwest of the Páramo del Castillo (6-8 km. north-northeast of Sevilla de Oro), *Camp E-5173*. Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), *Camp E-4810*. Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, *Camp E-75, E-96*. Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, Sierra de los Leones, near Baños, *Camp E-1696*.

The above collections come from elevations of 7,000-11,200 ft.; the plant is noted as an epiphyte, with stems pendant to 2 m., or as terrestrial, erect or spreading, up to 3 m. high, often irregularly branched; leaves pale green or deep green above and paler beneath; corolla greenish yellow or white tinged with pink; fruit white, translucent.

*Disterigma acuminatum* is a well-marked and fairly abundant species, occurring along the Andes from Colombia to Peru. Some of the Ecuadorian specimens, such as *Camp E-1729* and *Sydow 608* (US), from Tungurahua, have leaves larger than normal for the species.

*Disterigma pentandrum* Blake, Jour. Wash. Acad. 16: 364. 1926.

Chimborazo: Cañon of the Río Chanchan, about 5 km. north of Huigra, *Camp E-3313*; same general locality, directly above the village of Huigra, *Camp E-3480* (NY only). Cañar: Valley of Río de Cañar at "Selem," between Galleturo and Cañar, *F. Prieto CP-40*. Azuay: Nudo de Portete, Pacific side of pass between headwaters of the Ríos Tarqui and Giron, *Camp E-2175*. "Oriente" Border, east slope of Eastern Cordillera, between Oña and the Río Yacuambi, *F. Prieto P-271*.

Santiago-Zamora: Valley of the Río Zamora, east of Loja, ridge across the river from the village of Zamora, *Camp E-34* (NY only).

The cited specimens were collected at elevations of 5,000 to 9,500 ft.; the plants were noted as epiphytes or as shrubs up to 4 m. high growing on cliffsides or hanging from rocks; leaves crisp- or inflated-succulent, 1-2 mm. thick, deep green above, paler beneath, usually shining on both sides or dullish beneath; bracts pale chestnut-brown; calyx light pink to red; corolla crimson; fruit pale blue to deep lavender, the projecting calyx-lobes purplish or nigrescent-purple.

This series of specimens is a valuable addition to the known material of the species, which in 1933 (Brittonia 1: 231) I had known only from the two original collections. Since that time Sleumer (Notizbl. Bot. Gart. Berlin 12: 123, 1934) has cited several additional Ecuadorian specimens and discussed variation within the species, which is considerable but no more than normal in *Disterigma*.

Another specimen of this relationship is: Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, about 6,000 ft. elev., *Camp E-1738* (NY only) (plant hanging down to 0.3 m.; on cliff; flowers solitary in axils, deep rose; leaves subcarinate, red-tinged). This number is certainly allied to *D. pentandrum*, like which it has 5 stamens. However, its calyx-lobes are 1-1.5 mm. long, eciliate, and not thickened (those of the species being usually 2.5-4 mm. long, obviously glandular-ciliate, and distally thickened). I suspect that no. 1738 represents an undescribed species of this alliance, but the material is not adequate for description.

*Vaccinium floribundum* H. B. K. Nov. Gen. & Sp. 3: 266. pl. 251. 1818.

[Colombia: Nariño: Near Chiles, *Camp E-341*.] Carchi: *Camp E-297, E-298, E-313-E-317* incl., *E-333*. Pichincha: *Camp E-1704, E-1714*. Leon: *Camp E-2351*. Cañar: *Camp E-1796*. Azuay: *Camp E-384, E-389, E-463, E-1641, E-2063, E-2140, E-2264, E-5174, E-5243, s. n.*; *F. Prieto P-236A, P-236B, P-269, P-311*. Loja: *Camp E-95, E-272*.

The specimens cited above, which give an excellent picture of the degree of variation in typical *V. floribundum* in Ecuador, are accompanied by notes too extensive to be given here. In brief, the plant was found at elevations of 7,500 to 12,000 ft.; it was noted as a shrub up to 2 m. (or rarely as much as 3.5 m.) high, often low, spreading, or prostrate on páramos, in small or extensive colonies, with underground burls up to 10 cm. in diameter; leaves deep green above, paler beneath, dull on both sides or subnitid above; hypanthium green to purplish, or suffused with pink, sometimes subglaucous, the calyx-lobes sometimes red; corolla usually bright pink to red, sometimes white tinged with pink; fruit blue to black, glaucous or not.

The varieties of *V. floribundum* accepted by Sleumer (Notizbl. Bot. Gart. Berlin 13: 129-132, 1936) seem of very questionable value, being based on size and shape of leaves. However, I have attempted to arrange the present collections in these varieties. Those cited above fall into the typical variety as interpreted by Sleumer. It may be noted that nos. 389, 2264, 5243, and *s. n.* represent the form which Blake has described as *V. dasygynum* (which Sleumer reduces outright to typical *V. floribundum*), of which the calyx is pubescent.

*Vaccinium floribundum* var. *marginatum* (Dun.) Sleumer, Notizbl. Bot. Gart. Berlin 13: 131. 1936.

Cañar: Northeast of Azogues, *F. Prieto P-153*. Azuay: Páramo de Tinajillas and surrounding chaparral and forests, south of Cuenca, *Camp E-485*. Cordillera de Alpachaca, *Camp E-284* (NY only).

The specimens are from elevations of 9,800 to 11,000 ft., and the plant is noted as a spreading or arching shrub to 0.2 m., with a pink corolla and black fruit. This

variety, characterized by having its leaf-blades ovate and broadest toward the base, hardly seems worthy of separation from the typical variety; however, our specimens agree well with those from Ecuador cited by Sleumer.

*Vaccinium floribundum* var. *ramosissimum* (Dun.) Sleumer, Notizbl. Bot. Gart. Berlin 13: 131. 1936.

Carchi: Páramo del Angel, about 24 km. southwest of Tulcán, 11,500 ft. elev., *Camp E-286, E-290* (NY only). Loja: Cerro Villanaco, about 7 km. west of Loja, 8,000-9,500 ft. elev., *Camp E-210* (NY only).

The specimens are from low shrubs, up to 0.3 m. high, the older ones arising from a characteristic burl; corolla pink; fruit dark blue, subglaucous. The variety *ramosissimum*, characterized by its very small leaves, is perhaps somewhat stronger than var. *marginatum*, but still it appears to be merely an extreme form of the species from exposed locations.

*Vaccinium crenatum* (Don) Sleumer, Notizbl. Bot. Gart. Berlin 12: 291. 1935.

Azuay: Páramo de Tinajillas and surrounding chaparral and forests, 30-50 km. south of Cuenca, *Camp E-2284*. "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), *Camp E-1643, E-4819*. Ridge between El Pan and Guachapala, *Camp E-5245*. Loja: Cerro Villanaco, about 7 km. west of Loja, *Camp E-165, E-260* (NY only). Nudo de Cajanuma, south of Loja, *Camp E-562* (NY only). Santiago-Zamora: East of El Pan at about Azuay line, near "Laguna," *F. Prieto P-62*.

The cited specimens were obtained at elevations of 7,500 to 11,500 ft.; the plants are usually prostrate and trailing (rarely erect to 1 m. high) on banks, open slopes, and bare eroding areas, often rooting along the stem; leaves often reddish when young, later deep green and shining above, with nerves reddish beneath; corolla pink to bright red or crimson; fruit nigrescent-blue or purple-black, shining.

Venezuela to Peru; our material agrees well with the Ecuadorian specimens cited by Sleumer in Notizbl. Bot. Gart. Berlin 13: 133 (1936).

*Semiramisia speciosa* (Benth.) Kl. *Linnaea* 24: 25. 1851.

Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, ca. 10,000 ft. elev., *Camp E-107* (scrambling shrub, growing to 5 m. high, with stems up to 2.5-3 cm. diam.; corolla cylindric, not apically fluted, bright red, the base near calyx yellowish green; calyx green, conspicuously fluted).

The cited collection comes from near the type locality; I have recently (Contr. U. S. Nat. Herb. 29: 359. 1950) cited other Ecuadorian collections of the species.

*Semiramisia weberbaueri* Hoer. Bot. Jahrb. 42: 310. 1909.

Azuay: "Oriente" Border, Páramo del Castillo and surrounding forested area (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), 9,000-11,000 ft. elev., *Camp E-735* (shrub to 2 m., on ground; corolla basally green, apically bright red). Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), 6,500-7,500 ft. elev., *Camp E-756* (shrub 4 m.; corolla basally green, apically crimson).

The differences between this species and the preceding are perhaps not very significant; *S. weberbaueri* has comparatively narrow leaves which are acute to obtuse at base. The difference in the calyx-tube—whether smooth or angled—which I utilized in Contr. U. S. Nat. Herb. 28: 348-349 (1932), appears on the basis of more ample material to be of little consequence, the angles tending to disappear with maturity. The type of *S. weberbaueri* was from the Department of Amazonas, Peru, but other collections from Ecuador have been mentioned by me (op. cit. 350).

*Semiramisia hypogaea* A. C. Smith, sp. nov.

Frutex repens caespite fere saepe occultus praeter flores ubique glaber, ramulis gracilibus teretibus brunneis inferne radicanibus, internodiis interdum paucibracteatis, bracteis inconspicuis papyraceis lanceolatis circiter 2 mm. longis; petiolis subteretibus valde rugulosis 2-5 mm. longis crassis (1.5-2.5 mm. diametro); laminis crasso-coriaceis in sicco fusco-olivaceis late ovatis, 3.5-7 cm. longis, 2.5-4.6 cm. latis, basi rotundatis vel late cuneatis, apice subacutis raro (minoribus) subrotundatis, margine incrassatis et paullo recurvatis, maturis inconspicue immerso-glandulosis vel sparsissime castaneo-glanduloso-strigillosis (juvenilibus pilis rubris glandulosis 0.2-0.3 mm. longis utrinque strigillosis), costa utrinque leviter elevata, nervis primariis basalibus plerumque utrinsecus 2 curvato-ascendentibus haud elevatis, venulis immersis; floribus paucis in axillis solitariis vel infra folia orientibus ubique (i. e. pedicello, calyce, et corolla) pilis albidis circiter 0.3 mm. longis patentibus indutis, bracteis minutis; pedicellis leviter curvatis sub anthesi 7-8 mm. longis basim versus minute bibracteolatis superne paullo incrassatis et cum calyce continuis; calyce 4.5-5.5 mm. longo apice 4-5 mm. diametro, tubo cupuliformi circiter 3 mm. longo, limbo suberecto 1.5-2.5 mm. longo, lobis 5 deltoideis circiter 1.5 mm. longis et 1.5-2 mm. latis acutis, sinibus subacutis; disco annulari-pulvinato glabro; corolla siccitate fragili cylindrica sub anthesi 20-23 mm. longa 4-5 mm. diametro, lobis 5 oblongo-deltoideis 3.5-4 mm. longis 2-2.5 mm. latis obtusis; staminibus 10 corollam subaequantibus, filamentis ligulatis liberis glabris circiter 3 mm. longis, thecis levibus 5-6 mm. longis basi obtusis in tubulos gracillimos 15-18 mm. longos poris subterminalibus apertos terminantibus; stylo filiformi corollam subaequante, stigmatate minuto.

Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, about 10,000 ft. elev., July 2, 1944, *Camp E-88* (TYPE NY; dupl. US) (in pass, the plants spreading by runners, almost hidden in the short grass; young leaves brilliant red, green with age, and dull on both surfaces; flowers noted on old wood or in the axils of last year's leaves, apparently solitary; corolla deep red, hidden in the grass or sometimes below the surface of the turf; when flowers are produced below the surface of the soil the pedicels elongate and bring them to the surface; anthers brilliant yellow; this plant would be easily missed were it not for the bright red of the young leaves).

The remarkable habit described in Dr. Camp's field notes, which indicate that the flowers are sometimes subterranean, has not otherwise been noted in this group. Perhaps, however, the related *S. fragilis* A. C. Smith [including *Ceratostema longepedicellatum* Sleumer; see Bull. Torrey Club 63: 312 (1936) for reduction], also from Ecuador, may have a similar habit. These two species form a very distinct group without close allies in *Semiramisia*. From *S. fragilis* the new species differs in matters of degree which seem worthy of specific recognition; the leaves are considerably larger and predominantly acute at apex, the pedicels are shorter (but perhaps elongating as implied in the field note), the calyx is slightly larger, and the thecae of the anthers longer. Comparable dimensions in *S. fragilis* are: petioles 1.5-2 mm. long; leaf-blades 1.5-3 by 1.1-2.2 cm., rounded or broadly obtuse at apex; pedicels 10-20 mm. long at anthesis, up to 40 mm. in fruit; calyx 3-3.5 mm. long; thecae 2-3 mm. long.

*Ceratostema* Juss. Gen. Pl. 163. 1789.

*Englerodoxa* Hoer. Bot. Jahrb. 42: 310. 1909.

*Periclesia* A. C. Smith, Contr. U. S. Nat. Herb. 28: 357. 1932.

In my treatment of 1932 I recognized the genus *Englerodoxa* as composed of three species; shortly afterward the identity of this concept with *Ceratostema*



(sensu vero, non sensu A. C. Smith, Contr. U. S. Nat. Herb. 28: 335-348. 1932) was pointed out by Sleumer (Notizbl. Bot. Gart. Berlin 12: 278-282. 1935) and myself (Bull. Torrey Club 63: 307-309. 1936). *Periclesia* was established by the writer on the basis of a single species. At that time the distinction between the two genera seemed adequate, *Periclesia* having 4-merous flowers with extremely large calyx-lobes and connate filaments.

Now, however, several additional species have been referred to *Ceratostema* and four additional ones to *Periclesia*. These species serve effectively to break down the differences originally believed to separate the two genera, and the extensive material of this complex assembled by Dr. Camp and his assistants further indicates that the two concepts are no longer useful. With the addition of three novelties herewith described, 16 species of *Ceratostema* (sensu vero) may now be recognized. In order to facilitate identification in this difficult genus I give below a key to the known species.

*Ceratostema* may be circumscribed as having the following fundamental characters: calyx articulate with pedicel (the articulation rarely obscure or even lacking, in *C. loranthiflorum*); corolla large, often ventricose near base, deeply lobed; filaments free or connate, glabrous or pilose (but never with massed retrorse hairs); stamens with strongly granular thecae and very slender stiff tubules which dehisce by short oblique subterminal pores. It is geographically limited to the Andean area extending from southern Colombia through Ecuador and possibly into northern Peru, the precise locality of some collections being questionable. In the Ecuadorian Andes *Ceratostema* seems to be one of the most frequent and certainly one of the most striking vacciniaceous constituents of the flora.

In reconsidering the genus *Ceratostema* mention should be made of *C. speciosum* André (Illustr. Hort. 17: 52. pl. 9. 1870; A. C. Smith, Contr. U. S. Nat. Herb. 28: 345. 1932), which I referred to the genus *Plutarchia* in 1936 (Bull. Torrey Club 63: 312). The type of the species was obtained near Loja (south of the usual range of *Plutarchia*), and from the inadequate original description and plate it seems possible that the species actually does represent *Ceratostema* in the sense of the present treatment. The important character of the anther-dehiscence cannot be ascertained from the original publication; lacking this, I am still unable to place the species with certainty. If it does fall into *Ceratostema* it appears distinct from any of the species in my key below.

#### KEY TO THE SPECIES OF CERATOSTEMA

Calyx-limb very conspicuous, the lobes elongate-deltoid, at anthesis at least 10 mm. long.

Leaf-blades deeply cordate at base; calyx-lobes membranaceous, conspicuously reticulate-nerved.

Rachis, pedicels, and calyx pilose with whitish eglandular hairs; bracts and bracteoles small; calyx-tube 10-costate; leaf-blades soft-pilose beneath.

*C. peruvianum* Gmel.

Rachis, pedicels, and calyx copiously pilose with weak gland-tipped hairs; bracts and bracteoles papyraceous, 5-17 mm. long; calyx-tube terete; leaf-blades essentially glabrous.

*C. pensile* A. C. Smith, comb. nov.

Leaf-blades attenuate to obtuse at base.

Calyx-tube obconical, smooth, the lobes membranaceous, conspicuously reticulate-nerved; anthers with thecae 5-6 mm. long; flowers 4-merous; leaf-blades 4-6 x 1.2-1.8 cm.

*C. flexuosum* (A. C. Smith) Macbr.

Calyx-tube costate or winged, the lobes chartaceous to coriaceous; anthers with thecae 8-18 mm. long; flowers 5-merous (calyx- and corolla-lobes sometimes partially fused).

Leaf-blades lanceolate-oblong, 5-7 × 1-2 cm., obscurely pinnatinerved, soft-pilose beneath; pedicels, calyx-tube, and corolla densely pale-pilose; calyx-tube winged. *C. lanceolatum* Benth.

Leaf-blades elliptic or ovate-elliptic (rarely lanceolate), 6-12 × 2-8 cm., essentially glabrous, the secondary nerves ascending from or nearly from base; flowers glabrescent at or soon after anthesis.

Calyx 30-45 mm. long, the tube conspicuously 5-winged.

*C. reginaldii* A. C. Smith, comb. nov.

Calyx 20-28 cm. long, the tube regularly 10-costate.

*C. alberti-smithii* (Sleumer) Sleumer.

Calyx-limb comparatively inconspicuous, the lobes deltoid, ovate, or merely apiculate, not more than 7 mm. long at anthesis.

Sinuses of calyx-limb usually acute or obtuse, the lobes obvious, 1-7 mm. long.

Leaf-blades conspicuously cordate and amplexicaul at base.

Calyx-tube 10-costate; corolla 25-30 mm. long; leaf-blades up to 7.5 × 4.5 cm.; branchlets and young leaves soft-pilose.

*C. amplexicaule* A. C. Smith.

Calyx-tube terete; corolla 33-35 mm. long; leaf-blades up to 13.5 × 7 cm.; branchlets and leaves glabrous.

*C. silvicola* A. C. Smith.

Leaf-blades acute to rounded or faintly cordate at base, not amplexicaul.

Corolla 15-20 mm. long; calyx continuous with pedicel (or the articulation very obscure); leaf-blades usually lanceolate-elliptic, rarely more than 3.5 cm. broad.

*C. loranthiflorum* Benth.

Corolla at least 35 mm. long; calyx obviously articulate with pedicel.

Leaf-blades 6-12 cm. long, the principal nerves sharply ascending from or nearly from base.

Calyx-tube longitudinally furrowed, the lobes about 6 mm. long; corolla about 6 mm. in diameter near base; filaments about 3 mm. long.

*C. calycinum* (A. C. Smith) Sleumer.

Calyx-tube smooth, the lobes 2-3.5 mm. long; corolla strongly ventricose, 8-17 mm. in diameter near base; filaments about 5 mm. long.

*C. ventricosum* A. C. Smith, sp. nov.

Leaf-blades 2-6 cm. long, pinnatinerved.

Leaf-blades serrate or at least crenulate at the usually strongly recurved margin; calyx-tube narrowly winged, the limb scarcely 2 mm. long including the lobes.

*C. alatum* (Hoer.) Sleumer.

Leaf-blades entire at margin; calyx-lobes 5-7 mm. long.

Calyx-tube and corolla essentially terete, the calyx-lobes with marginal glands; corolla essentially glabrous; filaments firmly connate, the tubules 3-4 times as long as the thecae.

*C. nubigenum* A. C. Smith, comb. nov.

Calyx-tube and corolla 5-angled, the calyx-lobes eglandular; corolla villose; filaments free, the tubules 2-3 times as long as the thecae.

*C. campii* A. C. Smith, sp. nov.

Sinuses of calyx-limb flattened, the teeth minute, apiculate, scarcely 1 mm. long.

Calyx-tube 5-winged; corolla about 30 mm. long, essentially hypocrateriform, the limb flaring, with lobes 7-8 mm. broad at base; leaf-blades pinnatinerved, with 4-6 secondaries per side.

*C. charianthum* A. C. Smith.

Calyx-tube not winged; corolla 45-53 mm. long, subcylindric, the lobes about 3 mm. broad at base; leaf-blades 5- or 7-nerved from or nearly from base.

*C. prietoi* A. C. Smith, sp. nov.

*Ceratostema pensile* (A. C. Smith) A. C. Smith, comb. nov.

*Periclesia pensilis* A. C. Smith, Contr. U. S. Nat. Herb. 29: 364. 1950.

As mentioned in the above discussion, the connate filaments hardly serve to keep *Periclesia* apart from *Ceratostema*. In its more fundamental characteristics the present species seems closest to *C. peruvianum*, differing in its glandular-pilose inflorescence with large bracts and bracteoles, as well as in its essentially glabrous leaves. Thus far *C. pensile* is known only from the type collection, *Steyermark* 53798.

*Ceratostema flexuosum* (A. C. Smith) Macbr. Univ. Wyom. Publ. 11: 42. 1944.

*Periclesia flexuosa* A. C. Smith, Contr. U. S. Nat. Herb. 28: 357. pl. 7. 1932.

The species upon which the genus *Periclesia* was founded is also seen to be inseparable from *Ceratostema*, in view of subsequently described species of the complex. The 4-merous flowers and connate filaments can now hardly be considered of generic significance. The species remains known only from the type, *Lobb 79*, of which the precise locality is uncertain.

*Ceratostema reginaldii* (Sleumer) A. C. Smith, comb. nov.

*Periclesia reginaldii* Sleumer, Bot. Jahrb. 71: 400. 1941.

*Ceratostema macranthum* A. C. Smith, Contr. U. S. Nat. Herb. 29: 361. 1950.

Azuay: The eastern Cordillera, 1-8 km. north of the village of Sevilla de Oro, 8,000-9,000 ft. elev., *Camp E-4342, E-4619*. "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), 9,000-11,000 ft. elev., *Camp E-722, E-4851*. Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, ca. 10,000 ft. elev., *Camp E-108*. Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), Tambo Chontal to Tambo Consuelo, 5,700-8,000 ft. elev., *Camp E-1579*.

Field notes indicate that the species is diverse in habit, being a climbing vine (sometimes epiphytic), an erect or spreading shrub, or a tree up to 6 m. high; the leaves are deep green and shining above, paler and dull beneath; the inflorescence parts are deep crimson to red, the corolla being somewhat paler within and sometimes with salmon-pink lobes; the fruit is green or pale yellowish and is noted as being eaten by birds.

In recently proposing the new species *C. macranthum* I failed to consider the description of *Periclesia reginaldii*, of which type material is not available to me. However, a careful perusal of Sleumer's description indicates that the two species are identical. Sleumer referred his plant to *Periclesia* because of the connate filaments; these are, even in the type of *C. macranthum* and especially in some of the Camp specimens cited above, firmly coherent in young flowers, becoming at length essentially free. The type of *C. reginaldii* is *R. Espinosa 785*, collected near Loja.

The six collections cited above form a remarkable accretion to the known material of the species, which, as might be expected, proves more variable than indicated in the two previous descriptions. The following emendations should be noted. All of the Camp collections prove to have a much more fugacious indument than described for *C. macranthum*, or, indeed, they are essentially glabrous throughout. The leaves and inflorescence parts (including calyx and corolla) are in the present series glabrous at anthesis, or the calyx-limb may be puberulent only within. As to leaf-shape, nos. 108, 4342, and 4851 are very similar to *Steyermark 54311*, the type of *C. macranthum*. Numbers 722 and 4619 have leaf-blades more or less ovate and rounded at base, attaining dimensions of 12 × 8 cm. The inflorescence, in the Camp series, sometimes has as many as 15 flowers (although fewer usually develop) and a rachis up to 22 cm. long. The pedicel-length is very variable, sometimes 15-75 mm. on the same specimen (e. g. no. 722). Slight extensions of floral dimensions may be noted as follows: Calyx sometimes as short as 30 mm. (25 mm. on no. 1579) at anthesis, with lobes rarely as short as 10 mm.; corolla up to 55 mm. in length, with lobes up to 25 mm., these sometimes partially fused into 3 or 4 instead of 5; anthers up to 45 mm. (or perhaps more) in length, with thecae up to 20 mm. The most extreme specimen of those cited is no. 1579, which has the leaf-blades nearly lanceolate, 6-7 × 2-3 cm. (i. e. much narrower than usual), and the calyx in young fruit comparatively short.

*Ceratostema loranthiflorum* Benth. Pl. Hartw. 142. 1844.

Loja: Cerro Villanaco (ca. 7 km west of the city of Loja), 8,000–9,500 ft. elev., *Camp E-163, E-164, E-174* (NY only), *E-175* (NY only), *E-181, E-197, E-674*.

This species has thus far been collected only in the Province of Loja, and even there it has been known from only half a dozen collections. Dr. Camp's new material, therefore, is very welcome as permitting a better understanding of variation within the species. The plants are noted as shrubs from 0.3 to 2 m. high, arising from large subterranean burls. The leaves and flowers are very variable in width; e. g. nos. 175 and 181 have leaves up to 3.5 cm. broad, whereas in other available specimens they hardly exceed 2 cm. in breadth. Dr. Camp notes that the short broad type of leaf is correlated with a broad corolla, while relatively narrow leaves are associated with narrow corollas. No appreciable differences in corolla-length were noted in the various types. Frequently each calyx-lobe bears an inconspicuous callose gland dorsally near its base.

*Ceratostema ventricosum* A. C. Smith, sp. nov.

Frutex epiphyticus interdum scandens, ramulis gracilibus juventute albidopuberulis mox glabratis cinerascentibus; stipulis intrapetiolaribus inconspicuis oblongis circiter 2 mm. longis acuminatis; petiolis subteretibus rugulosis 2–6 mm. longis ut ramulis primo puberulis; laminis glabris in sicco fusco-viridibus lanceolato-vel ovato-ellipticis, 6–12 cm. longis, 2–5.3 cm. latis, basi obtusis vel rotundatis, in acuminem circiter 1 cm. longum gradatim angustatis, margine haud recurvatis, 5- vel obscure 7-nerviis, nervis intimis ad 1 cm. concurrentibus et costa supra leviter elevatis vel impressis subtus subprominentibus, nervis extimis inconspicuis, rete venularum utrinque prominulo vel supra immerso; inflorescentiis apices ramulorum versus axillaribus racemosis 2–8-floris breviter pedunculatis, rhachi tereti rugulosa 0.8–3 cm. longa obscure albidopuberula, bracteis sub floribus deltoideis 1.5–2.5 mm. longis acutis extus puberulis margine glandulas rigidas circiter 0.2 mm. longas interdum gerentibus; pedicellis teretibus ut rhachi puberulis sub anthesi 13–27 mm. longis articulationem versus incrassatis, paullo infra medium bracteolis 2 bracteis similibus 1.5–2 mm. longis ornatis; calyce sub anthesi 5–7 mm. longo apice 7–9 mm. diametro extus parce puberulo, tubo cylindrico 2–3 mm. longo, limbo subpatente 5-lobato, lobis oblongo-ovatis 2–3.5 mm. longis circiter 3 mm. latis apice apiculatis margine paullo incrassatis saepe glandulam callosam nigrescentem dorso gerentibus, sinibus acutis vel obtusis; disco carnosio annularipulvinato glabro; corolla glabra carnosura urceolato-cylindrica sub anthesi 35–47 mm. longa, basim versus conspicue ventricosa et 8–17 mm. diametro, superne angustata, profunde 5-lobata, lobis subulato-lanceolatis circiter 20 mm. longis et basi 3 mm. latis; staminibus 10 corollam fere aequantibus, filamentis submembranaceis liberis vel basim versus subcohaerentibus circiter 5 mm. longis intus parce pilosis, antheris 30–35 mm. longis, thecis 12–19 mm. longis basi obtusis et leviter incurvatis, tubulis gracillimis longitudine thecas subaequantibus per poros obliquos circiter 0.5 mm. longos dehiscentibus; stylo filiformi corollam subaequante, stigmate minute.

Santiago-Zamora: Eastern slope of the cordillera, near junction of Ríos Pailas and Negro, 6,000–7,500 ft. elev., Aug. 20–24, 1945, *Camp E-4912* (coll. F. Prieto) (TYPE US 1,989, 112; dupl. NY) (basal tuber epiphytic, the branches to 1 m. long; leaves deep green, subnitid above, dull beneath; pedicels bright green, clavate; hypanthium pale green to dull reddish, the articulation well marked, usually also with a dark line; calyx-lobes usually reddish, the pitted glands nigrescent; base of corolla deep crimson, the lobes nigrescent, spreading). Eastern slope and crest of main Cordillera Cutucú, 5,200 ft. elev., *Jorgensen Cuj-39* (NY only) (epiphytic vine; flowers red). Cordillera Cutucú, ridge just south and west of Río Itzintza,

4,500-5,500 ft. elev., *Camp E-1333* (NY only) (high-growing epiphyte; corollas found on ground, crimson, the lobes purple-black).

Of the cited specimens, no. 1333 consists only of fallen corollas, but it may confidently be referred to this species. The other two specimens show some foliar variability, the leaf-blades of no. *CuJ-39* tending to be more ovate and broader than those of the type, with rounded rather than obtuse bases. In inflorescence characters the two specimens are essentially identical, except that No. *CuJ-39* has bracts and bracteoles without the marginal glands which occur on the type; both specimens usually have a dorsal gland on each calyx-lobe of a very characteristic type.

*Ceratostema ventricosum*, although a very distinct species, has characteristics suggestive of several of its allies. Its leaves and inflorescences resemble those of *C. prietoi*, described below, but the calyx-limb is strikingly different, the corolla is more obviously ventricose, and the anther-proportions are different. In its calyx the new species resembles *C. loranthiflorum*, but that species has the calyx-articulation obscure or lacking, the corolla and stamens much shorter, and the leaves very different. From *C. calycinum*, which it resembles somewhat in foliage, *C. ventricosum* differs in its smooth calyx-tube and much shorter and differently shaped lobes, its more strongly ventricose corolla, and its longer filaments.

*Ceratostema alatum* (Hoer.) Sleumer, Notizbl. Bot. Gart. Berlin 12: 281. 1935.

Azuay: Páramo and sub-páramo area north and northwest of the Páramo del Castillo (ca. 6-8 km. n.-ne. of Sevilla de Oro), 10,000-11,200 ft. elev., *Camp E-5153*. "Oriente" Border, Eastern Cordillera, between Oña and the Río Yacuambi, on crest, 10,000-11,200 ft. elev., *F. Prieto P-295*. "Oriente" Border, Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), 9,000-11,000 ft. elev., *Camp E-700*, *E-746*; same locality, 11,000-11,300 ft. elev., *Camp E-4867*; same locality, east of El Pan, 11,000-11,350 ft. elev., *Camp E-1626*.

Field notes indicate the plant as a low shrub, up to 3 m. high in sheltered places; leaves dark green and shining above, pale and dull beneath; pedicels and hypanthium deep crimson or red; corolla deep crimson at base, shading to purple or black at tips of lobes; filaments pink; anthers brown; ripe fruit oblate-spheroid, up to 1.5 cm. long and 2 cm. in diameter, dull reddish, nitid, slightly sweet.

The excellent series of specimens cited above nearly doubles the number of collections known for this species, but the variation does not notably extend the limits of my earlier description (as *Englerodoxa alata* Hoer. in Contr. U. S. Nat. Herb. 28: 350. 1932). The leaves are sometimes up to 3 cm. broad and the corolla may be as short as 35 mm. at anthesis, although more often it exceeds 40 mm. in length. Since my 1932 treatment the following collections have been noted: Province of Pichincha, *Acosta-Solis* 8304 (Ch., US); Tungurahua, *Penland & Summers* 310 (NY); Santiago-Zamora, *Steyermark* 54333 (Ch).

*Ceratostema nubigenum* (A. C. Smith) A. C. Smith, comb. nov.

*Periclesia nubigena* A. C. Smith, Contr. U. S. Nat. Herb. 29: 366. 1950.

This is another species which, because of its connate filaments, I originally referred to *Periclesia*. Although, as originally noted, it has certain features suggestive of *Periclesia pensilis* (e. g. *Ceratostema p.*), it is a very distinct species closely related only to the following new entity.

*Ceratostema campii* A. C. Smith, sp. nov.

Frutex interdum epiphyticus et scandens, ramulis teretibus primo pilis albidis 0.3-0.5 mm. longis villosopuberulis mox glabratibus; stipulis intrapetiolaribus e

basi incrassato subulatis 2-4 mm. longis; petiolis rugulosis crassis 2-5 mm. longis mox glabratibus; laminae siccitate fuscis subcoriaceis lanceolato-vel oblongo-ovatis, 2.5-4.5 cm. longis, 1-3 cm. latis, basi rotundatis vel leviter cordatis, apice obtusis vel subacutis, margine valde recurvatis, utrinque primo pallide puberulis etiam parce glanduloso-strigillosis mox glabrescentibus, pinnatinerviis, costa supra plana vel leviter impressa subtus elevata, nervis lateralibus principalibus utrinsecus 2 vel 3 basim versus orientibus curvatis utrinque elevatis vel inconspicuis, rete venularum subimmerso; inflorescentiis axillaribus breviter racemosis 2-4-floris, rhachi angulata 4-6 mm. longa pilis 0.2-0.3 mm. longis albido-puberula, bracteis sub floribus deltoideis 1.5-3 mm. longis acutis extus puberulis; pedicellis sub anthesi 10-16 mm. longis parce villosis basim versus bibracteolatis, bracteolis bracteis similibus, articulatione manifesto; calyce sub anthesi 10-12 mm. longo et apice diametro, tubo circiter 5 mm. longo albido-villoso valde 5-angulato, limbo papyraceo suberecto ad basim 5-lobato extus parce villoso intus glabro utrinque inconspicue luteo-glanduloso, lobis ovato-deltoideis acuminatis 5-7 mm. longis 4-6 mm. latis, sinibus acutis; disco carnosus cupuliformi glabro; corolla carnosus 5-angulatus, sub anthesi 37-45 mm. longa et inferne circiter 10 mm. diametro superne angustata, ut calyce albido-villosus, lobis 5 elongato-deltoideis subacutis; staminibus 10 corollam fere aequantibus, filamentis inter se liberis submembranaceis ligulatis 3-4 mm. longis glabris, connectivo superne gradatim angustato, antheris 30-42 mm. longis, thecis 11-12 mm. longis basi subacutis, tubulis gracillimis quam thecis longioribus per poros obliquos circiter 0.5 mm. longos dehiscentibus; stylo filiformi longitudine corollam subaequante, stigmate truncato.

Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, ca. 10,000 ft. elev., July 2, 1944, *Camp E-106* (TYPE US 1,988,934; dupl. NY) (stiff shrub 3 m. high; leaves dull on both surfaces; calyx conspicuously fluted; corolla carnosus, deeply grooved, red, apically tinged with yellow). Nudo de Guagrauma, ca. 12 km. south of Zaraguro, 9,500-10,500 ft. elev., *Camp E-134* (NY only) (climbing epiphyte in sotobosque; flowers pendulous; calyx angled; corolla angled, pale crimson, the tip greenish yellow).

The two cited specimens agree very closely in fundamental details, but no. 134 has somewhat the narrower leaves and the larger flowers. The floral dimensions are probably a matter of age; in the description the larger dimensions are probably to be taken as representative of the floral measurements at anthesis.

The new species superficially resembles *C. nubigenum*, differing, as noted in my key, in its villose flowers, its angled calyx-tube and corolla, the absence of marginal calycine glands, its free filaments, and the differently proportioned anther-thecae and -tubules.

*Ceratostema charianthum* A. C. Smith, Contr. U. S. Nat. Herb. 29: 360. 1950.

Santiago-Zamora: Cordillera Cutucú, ridge just south and west of Río Itzintza, 4,500-5,500 ft. elev., *Camp E-1334* (NY only). Eastern slope and crest of main Cordillera Cutucú, 5,600 ft. elev., *Jorgensen CuJ-44* (NY only). Eastern slopes of the cordillera, near junction of Ríos Pailas and Negro, 6,000-7,500 ft. elev., *Camp E-4932* (coll. F. Prieto).

Field notes describe the species as a weak epiphyte or a vine growing on mossy banks or climbing trees in mossy forest, with adventitious roots which become enlarged and tuberous near the stem; leaves deep green above, paler beneath, dull on both sides; calyx pinkish; corolla bright rosy pink to pale crimson.

The three cited specimens are welcome additions to the material of the species, otherwise known only from the type, obtained in the same general region. Slight

amplifications of the original description may be noted: leaf-blades up to 13.5 cm. long, sometimes as narrow as 1.5 cm.; rachis of inflorescence sometimes insignificant, only 2 mm. long; pedicels varying from 5 to 13 mm. in length; calyx sometimes shorter than previously described, only 7 mm. long, the wings more obvious (about 1 mm. broad); corolla-lobes as much as 11 mm. in length; filaments connate toward base rather than completely free.

*Ceratostema prietoi* A. C. Smith, sp. nov.

Frutex epiphyticus ubique praeter filamentos glaber, ramulis gracilibus teretibus fuscis cinerascentibus; petiolis subteretibus rugulosis 3-5 mm. longis; laminis in sicco subcoriaceis vel papyraceis fusco-viridibus elliptico-lanceolatis, 10-17 cm. longis, 3-6 cm. latis, basi anguste rotundatis, in acuminem gracilem 1-2 cm. longum gradatim angustatis, margine integris et anguste recurvatis, 5 (vel 7-) nerviis, nervis e basi orientibus vel interioribus interdum ad 1-2 cm. concurrentibus, costa nervisque principalibus supra leviter impressis subtus elevatis, rete venularum utrinque subimmerso vel prominulo; inflorescentiis e ramulis infra folia orientibus racemosis 3-12-floris, rhachi subtereti 0.5-3 cm. longa breviter pedunculata, bracteis sub floribus deltoideis circiter 1 mm. longis mox caducis; pedicellis teretibus 13-20 mm. longis superne incrassatis, basim versus bracteolis 2 deltoideo-subulatis circiter 0.7 mm. longis caducis ornatis, articulatione conspicuo; calyce sub anthesi 7-9 mm. longo et apice diametro, tubo cupuliformi circiter 5 mm. longo ruguloso haud angulato, limbo suberecto papyraceo quam tubo brevior 5-dentato, dentibus apiculatis 0.5-1 mm. longis, sinibus complanatis; disco carnosio annulari-pulvinato; corolla carnosae cylindrica 45-53 mm. longa, basim versus 7-9 mm. diametro, superne angustata, profunde 5-lobata, lobis deltoideo-lanceolatis circiter 15 mm. longis et basi 3 mm. latis; staminibus 10 corollam fere aequantibus, filamentis liberis ligulatis 7-9 mm. longis ubique pallide puberulis, antheris circiter 40 mm. longis, thecis 9-11 mm. longis basi obtusis, tubulis quam thecis multo longioribus gracillimis per poros obliquos circiter 0.5 mm. longos dehiscen-tibus; stylo filiformi leviter exserto, stigmate minuto.

Cañar: Near El Corazón, between S. Vicente and Rosario, 3,500 ft. elev., Sept. 6-10, 1944, *F. Prieto CP-13* (TYPE US 1,988,905; dupl. NY) (high-growing epiphyte; leaves dull on both surfaces and not markedly "veiny" when fresh; corolla pale rosy pink, the lobes bright green). Valley of rio de Cañar at Abadel, below town of Galleturo, 6,000 ft. elev., *Prieto CP-28* (epiphyte, the branches drooping, to 2 m. long; leaves dark green above, pale below, dull on both surfaces; corolla deep pink, the tips of lobes green); same locality, 4,400 ft. elev., *Prieto CP-34* (epiphytic shrub; corolla crimson, the lobes green).

This very distinct new species resembles *G. charianthum* in general aspect and like that species has a calyx-limb with minute teeth and flattened sinuses. It differs obviously in its smooth rather than winged calyx-tube, its differently shaped and longer corolla with narrower lobes, its longer stamens, and its leaf-blades with the principal nerves oriented essentially from the base.

*Oreanthes glanduliferus* A. C. Smith, sp. nov.

Frutex epiphyticus, ramulis gracillimis obtuse angulatis subfuscis pallide puberulis et interdum parce glanduloso-hispidulis, mox glabrescentibus cinerascentibus; stipulis inconspicuis intrapetiolaribus oblongis obtusis circiter 1 mm. longis saepe ramulos adnatis; petiolis subteretibus rugulosis 1.5-3 mm. longis glanduloso-hispidulis (pilis 0.3-0.7 mm. longis) etiam puberulis mox glabratis; laminis in sicco coriaceis (in vivo subsucculentis et inflatis) elliptico-ovatis, 2.5-4.2 cm. longis, 1.3-2.3 cm. latis (apices ramulorum versus interdum 15 x 8 mm.), basi late obtusis vel subrotundatis, apice obtusis, margine siccitate sub-

cartilagineis et paullo recurvatis, juventute utrinque ut petiolis parce glanduloso-hispidulis mox glabratis, e basi obscure 3- vel 5-nerviis, costa supra leviter impressa subtus elevata vel ut nervis utrinque immersa; inflorescentiis axillaribus 1-3-floris, rhachi subnulla, bracteis sub pedicellis deltoideis circiter 1 mm. longis; pedicellis teretibus gracillimis sub anthesi 5-20 mm. longis, pilis glanduloso-capitatis 0.4-0.7 mm. longis copiose hispidulis ac etiam pilis eglandulosis circiter 0.1 mm. longis pallide hispidulis; calyce sub anthesi 7-10 mm. longo et circiter 3 mm. diametro cum pedicello continuo extus ut pedicello copiose glanduloso-hispidulo et puberulo, tubo obovoideo 3-6.5 mm. longo (paullo post anthesin), limbo erecto ad basim 5-lobato, lobis papyraceis lineari-subulatis 3.5-4.5 mm. longis basi circiter 1 mm. latis intus glabris; disco carnosio annulari-pulvinato glabro; corolla in sicco submembranacea subcylindrica, 20-22 mm. longa, basim versus 3-5 mm. diametro, basi ipso et faucibus contracta, extus parce glanduloso-hispidula etiam pallide puberula, lobis sub anthesi patentibus oblongis 3.5-4 × 1-2 mm. apice obtusis; staminibus 5 corolla fere aequilongis, filamentis leviter cohaerentibus submembranaceis 2-2.5 mm. longis glabris, thecis levibus membranaceis circiter 3.5 mm. longis basi obtusis et leviter incurvatis, tubulis 14-15 mm. longis gracillimis per poros subterminales dehiscentibus; stylo filiformi leviter exserto, stigmatate subtruncato.

Cañar: Valley of Río de Cañar at Abadel, below town of Galleturo, 6,000 ft. elev., Sept. 6-10, 1944, *F. Prieto CP-29* (TYPE US 1,988,910; dupl. NY) (epiphyte; leaves pale green, only slightly shining, inflated and subsucculent; corolla crimson); same locality, 4,400 ft. elev., *F. Prieto CP-37* (unilate, NY) (epiphyte; leaves subsucculent and inflated; corolla crimson).

The second known species of *Oreanthes*, described above, differs from *O. buxifolius* Benth. in its conspicuous and slender pedicels, the copious hispid-glandular pubescence of its flowers (present also but less obvious on other parts of the plant), its comparatively short and essentially free filaments, and its differently proportioned anthers, of which the thecae are much shorter. The genus *Oreanthes* remains an extremely rare entity in collections. It is apparently restricted to Ecuador, but since noting only the type collection of *O. buxifolius* in my 1932 treatment (*Contr. U. S. Nat. Herb.* 28: 359), I have seen two other collections of that species, *Penland* 62 (NY) from Loja and 1180 (NY) from Tungurahua.

*Macleania macrantha* Benth. *Pl. Hartw.* 223. 1846.

Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, about 6,000 ft. elev., *Camp E-1737* (shrubs, arching to 2-3 m.; leaves very green above, very pale beneath; pedicels green; hypanthium winged, reddish or green; corolla deep crimson to coral-red, carnosae; filament-tube pink, the connectives white, the anthers yellow).

The type of this striking species also comes from the vicinity of Quito. It seems probable that *Camp E-1718* (NY only) (shrub 1 m.; leaves deep green above, pale beneath; hypanthium grooved), from the same locality as no. 1737, represents a stage of *M. macrantha* with very young flower-buds. In this stage the corolla is subglobose and less than 5 mm. long, but the minute anthers are seen to be typically single-tubuled. A series of developing flowers would be very informative in evaluating corolla-length as a specific criterion in this section of *Macleania*; it is likely that too much weight has been given to this character.

*Macleania floribunda* Hook. *l.c. Pl. 2: pl. 109.* 1837.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, Sierra de los Leones, near Baños, 7,000 ft. elev., *Camp E-1697* (NY only) (subepiphytic; flowers coral-red).



The cited specimen agrees excellently in detail with the type and only previously known collection, *Mathews 1442*, from the Department of Amazonas, Peru. In no. 1697 the corolla has a fugacious white puberulence as well as the characteristic and more persistent brownish glandular hairs, this being the only difference noted between it and the type.

*Macleania recumbens* A. C. Smith, sp. nov.

Frutex subrecumbens, ramulis gracilibus subteretibus brunneis glabris mox decorticantibus; petiolis rugulosis 3-5 mm. longis superne angulatis; laminis subcoriaceis in sicco fusco-olivaceis ovatis, (3.5-)7-11 cm. longis, (2-)3-7 cm. latis, basi acutis et in petiolum decurrentibus, in acuminem ad 2 cm. longum gradatim angustatis raro tantum breviter acuminatis, margine integris leviter recurvatis, supra glabris, subtus dispersim et minute glanduloso-strigillosis, costa et nervis utrinsecus 2 vel 3 ad 2 cm. supra basim orientibus adscendentibus supra impressis subtus valde elevatis, venulis subimmersis; floribus axillaribus solitariis bracteis pluribus papyraceis deltoideis subacutis circiter 1 mm. longis subtentis, pedicellis gracilibus striatis (forsan 5-sulcatis) sub anthesi 8-9 mm. longis basim versus minute bibracteolatis; calyce turbinato sub anthesi circiter 9 mm. longo et apice 6 mm. diametro, tubo elongato circiter 7 mm. longo basim versus obscure pallido-glanduloso-strigilloso alis carnosis circiter 1.5 mm. latis manifeste 5-alato, limbo erecto minutissime 5-denticulato, sinibus complanatis; corolla carnosa cylindrica circiter 25 mm. longa et basim versus 5 mm. diametro, faucibus contracta, intus apicem versus albedo-pilosa alioqui glabra, lobis 5 oblongis subacutis circiter 3 mm. longis; staminibus 10 circiter 11 mm. longis, filamentis in tubum glabrum submembranaceum circiter 5 mm. longum connatis, antheris 7.5-8 mm. longis, thecis 4.5-5 mm. longis basi inflexis, tubulo unico 2.5-3 mm. longo conico, rima ovali subaequilonga; stylo filiformi corollam subaequante truncato.

El Oro: In Moro-Moro region (about 21 miles west of Portovelo), 3,400-4,200 ft. elev., Oct. 7, 1944, *Camp E-627* (TYPE US 1,988,986; dupl. NY) (plants subrecumbent, with some branches to 1 m. long, in dense rain-forest; flowers solitary in axils of leaves; corolla deep coral-red).

The new species is probably most closely related to *M. floribunda* Hook., differing in its larger and longer-acuminate leaf-blades and its essentially glabrous (rather than distinctly castaneous-glandular-strigillose) flowers. The species in this section of *Macleania* (i. e. the species numbered 1 to 6 in my key in *Contr. U. S. Nat. Herb.* 28: 360. 1932) are fairly close and are not well represented in herbaria; an eventual reconsideration of specific lines will certainly be desirable. Within this alliance, the new species is close only to *M. floribunda* and *M. angulata* Hook., being distinguished from the latter by having its leaf-blades more definitely narrowed at both ends, its flowers solitary and with much shorter pedicels, and its corolla cylindrical rather than angled.

*Macleania sleumeriana* A. C. Smith, *Contr. U. S. Nat. Herb.* 29: 367. 1950.

Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, about 6,000 ft. elev., *Camp E-1735* (NY only) (terrestrial shrubs 0.4-1 m. high; leaves deep green above, pale beneath; upper part of pedicels and hypanthium bright red-orange at anthesis, later fading to cream-yellow, with only the wings red-tinged; base of corolla reddish coral, the upper half deep green).

The species (*Anthopterus ericae* Sleumer, non *Macleania ericae* Sleumer) appears to be rare; this is only the third collection known to me, all being from northern Ecuador.

*Macleania salapa* (Benth.) Benth. & Hook. Gen. Pl. 2: 566. 1876.

Loja: Nudo de Cajanuma (south of Loja), 7,600 ft. elev., *Camp E-569* (shrub 2 m.; hypanthium ribbed; corolla pale pink). Mataperro region, a pass between the Cordillera de Cisne and the Cordillera Chicuanco, about halfway between Zaruma and Loja, 7,100 ft. elev., *Camp E-646* (shrub to 3 m., common on dry soil in the pass; flowers pale red).

Apparently limited to southern Ecuador; I have seen specimens from only Loja and El Oro. The combination was not properly made in *Genera Plantarum*, and perhaps the correct citation of the authority should be (Benth.) Hook. f. ex Hoer. Bot. Jahrb. 42: 269. 1909.

*Macleania rupestris* (H. B. K.) A. C. Smith, Phytologia 1: 131. 1935.

Carchi: Slopes of Volcán Chiles, *Camp E-319, E-320, E-327, E-334*. East of Tulcan, *Camp E-363*. Pichincha: West of Quito, on Sto. Domingo Road, *Camp E-1706, E-1707, E-1719*. Cañar: Between Tambo and Suscal, north rim of the valley of the Río de Cañar, *Camp* (coll. M. Giler) *E-2766, E-2770A, E-2770B*. Azuay: Along the Río Matadero, west of Cuenca, *Camp E-1942, E-1983, E-1985*. Valley of the Río Surucuchu, west of Cuenca, *Camp E-4240*. Along the Río Cumbe, south of Cuenca, *Camp E-2077, E-2080*. Páramo de Tinajillas, south of Cuenca, *Camp E-481*. Loja: Cerro Villanaco, west of Loja, *Camp E-233*.

Dr. Camp's notes pertaining to the extensive suite of specimens cited above are very detailed. Briefly summarized, they indicate that the species was observed in Ecuador at elevations of 8,500–11,400 ft., occurring on páramo, in the páramo-sotobosque zone, or in subpáramo chaparral; specimens were noted as small trees (rarely) or more often as spreading or sprawling shrubs 1.5–6 m. high, sometimes as much-branched vines climbing through low trees; soft-tissued basal burls were often observed; the corolla is pale crimson to pink at base and paler or white distally; the mature fruit is as much as 1.5 cm. in diameter, shining black, and insipid.

In 1932 (Contr. U. S. Nat. Herb. 28: 360–384) I recognized ten Ecuadorian species in the group of *Macleania* with 2-tubuled anthers, although some of these were admittedly segregated on rather insignificant characters. In addition, four species based on Ecuadorian types were reduced to synonymy; one other species from Ecuador, *M. mollis*, has been described more recently. The accumulation of herbarium material since 1932 and a study of the present material incline me to believe that specific lines in the 2-tubuled *Macleaniae* cannot be satisfactorily established by observational methods. Particularly in Ecuador, which seems to be a center of development of the group, the usual specific criteria are combined in such diverse ways that one must assume free inter-breeding among the "species" to be a continuing phenomenon. In view of this, to apply specific names to parts of the population is perhaps undesirable; but nevertheless I have identified the Camp collections according to current concepts, with the reservation that these concepts may be far from natural.

*Macleania rupestris* (based on the oldest available specific epithet for this group, *Thibaudia rupestris* H. B. K. 1818), in the strict sense, is characterized by being essentially glabrous throughout, with flowers of moderate size (corolla usually 15–20 mm. long) and stamens with tubules subequaling the thecae in length. Its leaves are variable, but in general they are rounded to acute at base and pinnatinerved. The Central American *M. glabra* (Kl.) Hoer. is scarcely to be distinguished from the common South American species.

*Macleania pilgeriana* Hoer. Bot. Jahrb. 42: 301. 1909.

Pichincha: Páramo west of Quito on Sto. Domingo Road, 11,300 ft. elev., *Camp E-1705, E-1710* (shrubs 1–2 m.; corolla deep red).

The cited specimens agree well with type material (also from Pichincha) in foliage and in the elongate anther-tubules; I doubt whether this entity should be kept apart from *M. rupestris* even on a subspecific level.

*Macleania benthamiana* Walp. Repert. Bot. 6: 415. 1847.

Chimborazo-Cañar border: Western escarpment, between Sta. Rosa and Joyagshi, 8,300-9,000 ft. elev., *Camp E-4043* (shrub to 2 m., from relatively small burl). Azuay: Páramo de Tinajillas and surrounding chaparral and forests, 30-50 km. south of Cuenca, 9,200 ft. elev., *Camp E-453* (spreading shrub to 3 m.). Same locality, 11,000-11,500 ft. elev., *Camp E-2285* (shrub 2 m., from burl about 0.3 m. in diameter).

The cited specimens have leaves which are deep green above and paler beneath; the hypanthium is greenish to deep red, the corolla crimson to coral or pale pink toward base, paler distally, the filaments white, the anthers orange. The numerous oblong-lanceolate bracts subtending the inflorescence distinguish this entity from *M. rupestris*. It is essentially glabrous throughout and typically has rather large and coriaceous leaves, with the principal nerves strongly raised beneath; the cited specimens, however, have leaves smaller than typical.

*Macleania ecuadorensis* Hoer. Bot. Jahrb. 42: 300. 1909.

Cañar: Uplands called "Huairacaja," 10-20 km. northeast of Azogues, 11,000 ft. elev., *Camp E-1758* (shrub 4 m.; leaves dull, deep green above, pale beneath; corolla deep pink toward base, apically white, becoming crimson with age). Azuay: Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), 9,000-11,000 ft. elev., *Camp E-725A* (NY only) (erect shrub 2 m.; flowers deep red). Páramo and subpáramo area north and northwest of the Páramo del Castillo, 10,000-11,200 ft. elev., *Camp E-5157* (NY only) (shrub 2 m.; leaves deep green above, pale beneath; corolla basally crimson, the apex and lobes pale pink).

*Macleania ecuadorensis* has the leaves characteristically white-pilose beneath, with prominent secondary nerves, and regularly oval in shape. However, no. 1758 has narrower than typical leaves, while nos. 725A and 5157 have the calyx and corolla faintly pilose. The entity seems hardly more than an expression of character-combinations in the general complex of *M. rupestris* and *M. hirtiflora*.

*Macleania loeseneriana* Hoer. Bot. Jahrb. 42: 302. 1909.

Pichincha: Western slope of the cordillera, Cerro Corazón, 11,000 ft. elev., *Camp E-1647* (NY only) (spreading shrub to 3 m.; leaves dull on both surfaces, deep green above, paler beneath; hypanthium red; corolla basally pale red, apically white; immature fruit dull, non-glaucous).

The robust habit and inflorescence, pilose flowers, and calyx with large subspreading limb make this one of the more easily identified entities among the 2-tubuled *Macleaniae*.

*Macleania hirtiflora* (Benth.) A. C. Smith, Contr. U. S. Nat. Herb. 28: 382. 1932.

Cañar: Uplands called "Huairacaja," 10-20 km. northeast of Azogues, *Camp E-1756*. Azuay: Páramo de Tinajillas and surrounding chaparral and forests, 30-50 km. south of Cuenca, *Camp E-386*. Cordillera de Alpachaca, *Camp E-285*, *E-532*, *E-536*, *s. n.* (May 22, 1944). Páramo de Carboncilla, about 15 km. south of Oña, *Camp E-554A-E-544F* incl. (NY only). Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), *Camp E-4844*. Eastern Cordillera, between Oña and the Río Yacuambi, *F. Prieto P-231* (NY only).

The cited specimens were collected at elevations of 8,000 to 11,200 ft., on páramo or subpáramo; they are noted as shrubs up to 4 m. high, often spreading

from large burls (these sometimes more than 1 m. in diameter); leaves deep green and subnitid above, paler beneath; hypanthium often red or crimson; corolla deep crimson to pink at base, paler or yellowish or white distally; fruit elongate-spherical, when ripe purple-black and up to 1.5 cm. in diameter, sweetish or insipid.

These specimens are variable in details, as indeed are those I referred to this species in 1932 and the numerous ones so identified since that time. It seems unlikely that this concept represents a natural genetic unit; actually the specimens might be construed as representing extreme forms of various strains of *M. rupestris*, characterized by the pilose flowers, a tendency toward shorter corollas and stamens, and frequently pilose leaves. The indument seems persistent on the pedicels and calyx, but it is sometimes fugacious on the corolla. Among the specimens from Azuay, nos. 285, 386, 532, and 536 have an unusually persistent corolla-indument, as well as a tendency toward very small leaves.

***Macleania* cf. *hirtiflora* (Benth.) A. C. Smith.**

Cañar: Páramo between Biblian and Cañar, *Camp E-447*. Parroquia Bayas, valley of Río Tabacal, about 15 km. northeast of Azogues, *F. Prieto P-118*. Region of San Marcos, about 10 km. northeast of Azogues, *F. Prieto P-80*. Uplands called "Huairacaja," 10-20 km. northeast of Azogues, *Camp E-1754*, *E-1811*. Azuay: Cruz Pamba region above Baños, about 15 km. southwest of Cuenca, *Camp E-3939* (coll. *M. Giler & F. Prieto*). The eastern Cordillera, 4-6 km. north of the village of Sevilla de Oro, *Camp E-4702*. Vicinity of El Pan, *Camp E-500*. Páramo del Castillo and surrounding forested areas (crest of the eastern cordillera on the trail between Sevilla de Oro and Mendez), *Camp E-716*, *E-721* (NY only), *E-724* (NY only).

The cited specimens were obtained at elevations between 8,500 and 11,000 ft.; they came from erect, spreading, or scrambling shrubs 2-5 m. high, sometimes with large soft burls; leaves deep green and subnitid above, pale and dull beneath; hypanthium crimson; corolla crimson to pink, tipped with yellow, white, or pale pink; fruit ellipsoid, when mature about 2 × 1.5 cm., pink- or red-flushed, sweetish but flat in taste; local name *guayapa*, used for plants of this general affinity.

These collections agree with *M. hirtiflora* in the indument of their flowers and sometimes of their foliage, but their inflorescences are subtended by elongate bracts similar to (or approaching in size) those of *M. benthamiana*. It must be assumed, I think, that these two species are interfertile where their ranges coincide, if indeed either species is more than a series of variations from *M. rupestris*. The cited specimens also suggest other "species" of this complex. In some, e. g. no. 4702, the leaves may be coriaceous and prominently nerved as in typical *M. benthamiana*, but sometimes strictly glabrous and sometimes pilose in precisely the manner typical for *M. ecuadorensis*. Number 721 is accompanied by extraordinarily large leaves (blades up to 16 × 10 cm.), although its inflorescences are associated with leaves of normal size.

***Macleania mollis* A. C. Smith, *Phytologia* 1: 132. 1935.**

Cañar: Valley of Río de Cañar at "Selem," between Galleturo and Cañar, 7,000 ft. elev., *F. Prieto CP-38*, *CP-39* (terrestrial shrubs 2 m.; leaves deep green, dull or somewhat shining; corolla coral-red).

These are the only collections of the species known to me except for the type, from Chimborazo. While this entity is not too distinct from certain forms of *M. hirtiflora*, it is distinguishable by its subcordate leaf-blades with more basally oriented and ascending secondary nerves, its few-flowered fasciculate inflorescences, and its corollas averaging longer. On the whole, *M. mollis* seems a stronger "species" than most of this relationship.

**Macleania coccoloboides** A. C. Smith, sp. nov.

Frutex ad 3 m. altus vel epiphyticus et subscandens ubique praeter ramulos et petiolos glaber, ramulis robustis subteretibus nigrescentibus primo et petiolis minute pallido-puberulis mox glabratis; petiolis crassis (2-5 mm. diametro) subteretibus rugulosis 3-7 mm. longis; laminis in sicco coriaceis fusco-viridibus suborbiculari-ovatis, (4-)6-15 cm. longis, (3-)4-9.5 cm. latis, basi rotundatis vel leviter cordatis, apice rotundatis (juventute forsitan late obtusis), margine incrassatis et leviter recurvatis, ubique dispersim punctato-glandulosis, pinnatinerviis, costa supra leviter insculpta subtus prominente, nervis secundariis utrinsecus 3 vel 4 supra subplanis vel prominulis subtus valde elevatis, inferioribus e costa basim versus orientibus curvato-adscendentibus, superioribus debilioribus, rete venularum immerso vel utrinque haud prominulo; inflorescentia axillari congesta breviter racemosa ut videtur 7-10-flora bracteis numerosis subcoriaceis oblongo-deltaideis circiter 2 mm. longis basi circumdata, bracteis floriferis reniformibus 1-1.5 mm. longis, rhachi crassa sub fructu 5-7 mm. longa; pedicellis crassis teretibus rugulosis sub anthesi ad 9 mm. sub fructu ad 20 mm. longis, apice conspicue incrassatis et margine apicali obscure glandulosis, cum calyce manifeste articulatis, basim versus bibracteolatis, bracteolis late deltaideis 1-2 mm. longis circiter 2.5 mm. latis obtusis; calyce sub anthesi 7-8 mm. longo et apice diametro ubique dispersim nigro-punctato-glanduloso, tubo cupuliformi circiter 5 mm. longo, limbo suberecto carnoso 2-3 mm. longo minute 5-denticulato, sinibus complanatis; corolla carnosa urceolato-cylindrica sub anthesi 13-14 mm. longa et basim versus circiter 7 mm. diametro, superne paullo angustata, lobis 5 deltaideis subacutis circiter 1.5 mm. longis; staminibus 10 quam corolla multo brevioribus, filamentis ligulatis 1.5-2 mm. longis, connectivis latis, antheris circiter 7 mm. longis, thecis crassis quadrangularibus circiter 5 mm. longis basi obtusis et incurvis in tubulos 2 graciles acutos circiter 2 mm. longos saepe ad basim liberos rimis elongatis ovalibus dehiscentes abrupte angustatis; stylo filiformi corollam subaequante, stigmatibus minuto; fructibus elongato-subglobosis ad 1 cm. diametro calycis limbo coronatis.

Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, 7,000-8,500 ft. elev., Jan. 15, 1945, *Camp E-1726A* (TYPE US 1,989,052; dupl. NY) (shrub 1-3 m., arching from banks, arising from a burl up to 0.3 m. in diameter, also seen as a high-growing epiphyte and then also with burl; branches sooty-black; leaves very deep green above, pale to subglaucous beneath, with glands at first black and later conspicuous by the presence of a white fungus; hypanthium pale yellow to red, very shallowly grooved, the calyx margin and sometimes the base with notable pits; corolla deep crimson; fruit ripening deep purple-black, shining), *E-1726B* (NY only) (young plant of no. 1726A, showing the burl, this soft-parenchymatous, not woody). Same general locality, Cerro Corazón, 8,000-9,300 ft. elev., *Camp E-1679* (NY only) (epiphytic and vine-like; twigs dark, blackish; leaves exceptionally dark green above, pale and glaucous beneath; immature fruits pale, subtranslucent).

This new species is readily distinguished by its comparatively short corollas and anthers abruptly terminating in very short, slender tubules. It does not seem to have very close allies, but in some ways it suggests *M. costeroides* Sleumer (Bot. Jahrb. 71: 401. 1941), also of Ecuador. From this, *M. coccoloboides* differs in its larger leaf-blades with more highly connate nerves, its very short inflorescences, minutely denticulate calyx-limb, longer corolla, and stamens with free filaments and separate tubules.

**Psammisia corallina** A. C. Smith, sp. nov.

Frutex epiphyticus ubique glaber; ramulis robustis obtuse angulatis in sicco striatis fuscis; petiolis valde rugulosis angulatis incrassatis 10-12 mm. longis;

laminis coriaceis siccitate fuscis ellipticis, 10-15 cm. longis, 6-7.5 cm. latis, basi acutis et in petiolum conspicue decurrentibus, apice breviter et obtuse cuspidatis, margine valde recurvatis, 5-nerviis, nervis summis cum costa 1-3 cm. concurrentibus et cum costa supra leviter impressis (basim versus elevatis) subtus prominentibus, nervis infimis basalibus inconspicuis, rete venularum utrinque prominulo vel immerso; inflorescentiis 1-3 in axillis foliorum breviter racemosis 6-15-floris, floribus caducis, rhachi robusta 2-4 cm. longa articulationibus valde incrassata, bracteis sub floribus papyraceis deltoideis 1-1.5 mm. longis subacutis; pedicellis robustis sub anthesi 15-25 mm. sub fructu juvenili ad 35 mm. longis basim versus bibracteolatis, bracteolis minutis; calyce caroso sub anthesi 6-7 mm. longo et 8-9 mm. diametro, tubo obtuse angulato 3-4 mm. longo, limbo subpatente 5-denticulato margine leviter incrassato et inflexo, lobis haud 1.5 mm. longis apiculatis, sinibus complanatis vel rotundatis; disco conspicue annularipulvinato; corolla carosa subgloboso-conica sub anthesi circiter 9 mm. longa et 8 mm. diametro, lobis deltoideis subacutis circiter 1.5 mm. longis; staminibus 10, filamentis in tubum 1.5-2 mm. longum connatis, connectivis ecalcaratis, antheris maturis circiter 7.5 mm. longis, thecis crassis circiter 6 mm. longis basi obtusis supeme in tubulos breves acutos cum rimis angustis angustatis; stylo tereti corollam subaequante truncato.

Santiago-Zamora: Cordillera Cutucú, ridge between the Ríos Itzintza and Chupiasa, 4,000-4,500 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1280* (TYPE US 1,989,014; dupl. NY) (epiphyte, with branches about 1 m.; leaves dark green above, pale beneath; pedicels and hypanthium pale pink, the corolla coral-red).

From its closest relative, the Colombian *P. occidentalis* A. C. Smith, the new species is readily distinguished by its much more robust inflorescence, with stouter and longer rachis and pedicels and larger flowers; the largest corollas seen in *P. occidentalis* hardly exceed 5 mm. nor the longest anthers 3 mm. in length. The Ecuadorian *P. flaviflora* A. C. Smith (*Jour. Arnold Arb.* 24: 463. 1943) is less closely related to the new species, differing in its caudate-acuminate leaf-blades, short inflorescence, calyx-limb with larger lobes and acute sinuses, free filaments, and shorter, spurred anthers.

*Psammisia ecuadorensis* Hoer. *Bot. Jahrb.* 42: 308. 1909.

Cañar: Near El Corazón, between S. Vicente and Rosario, 3,500 ft. elev., *F. Prieto CP-12* (low-growing epiphyte with pendant branches 1-3 m. long; leaves dull above, shining beneath; pedicels coral-red; corolla deep crimson).

The species is known from several Ecuadorian collections and possibly extends northward into Colombia.

*Psammisia ferruginea* A. C. Smith, *Contr. U. S. Nat. Herb.* 28: 391. *pl.* 10. 1932.

Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, about 6,000 ft. elev., *Camp E-1736* (shrub, with branches 3 m. long). Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, Shell Mera (east of Mera), about 3,500 ft. elev., *Camp E-1701* (NY only) (large spreading plant, in part epiphytic; flowers pink). Same locality, uplands near El Topo, along trail to La Gloria, 4,000-5,000 ft. elev., *Camp E-2399* (NY only) (arching epiphyte, common at lower elevations). Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Tres Ranchos and Chontal, 2,700-5,700 ft. elev., *Camp E-1566* (epiphytic vine; hypanthium pale red; corolla pale yellow at anthesis, later pale red). Cordillera Cutucú, ridge ascending into central Cutucú, 4,400-4,700 ft. elev., *Camp E-1159* (immense climbing and epiphytic plants, some 5 m. across and hanging over 10 m., common along streams on west slope of the Cutucú; pedicels

and calyx pink-tinged; corolla yellow in bud, at anthesis tinged with pink under the crimson hairs; body of corolla red at about time it is ready to fall, and crimson as it lies on the ground; some plants with flowers redder than others at anthesis). Same locality, on banks of Río Itzintza, 3,500 ft. elev., *Camp E-1199* (high-climbing epiphyte, common in this region but seen only along streams; leaves green above, paler beneath; pedicels and hypanthium crimson; corolla yellow in bud, with crimson hairs, becoming red or even crimson in age, apically constricted; filaments and connectives white, the anthers yellow).

The excellent series of specimens cited forms a welcome addition to the herbarium material of this species, which otherwise I have known only from southern Colombia (Cauca, El Valle, Nariño, and Putumayo). Dr. Camp's material, of course, demonstrates a few minor variations from the original description, but the fundamental characters of the species are unmistakable.

*Psammisia sodiroi* Hoer. Bot. Jahrb. 42: 306. 1909.

Pichincha: Western slope of the cordillera, Cerro Corazón, 8,000-9,300 ft. elev., *Camp E-1680* (vine-like epiphyte; leaves pale green and dull above, paler but subnitid beneath; pedicel basally greenish, apically bright coral-red; hypanthium bright coral-red at anthesis, the color fading to dark green as the fruit enlarges; corolla deep red toward base, pale green in upper half; flowering irregular, sometimes at apex of stem, or later on nearly bare wood). Along the road from Quito to Sto. Domingo de los Colorados, 7,000-8,500 ft. elev., *Camp E-1728* (NY only) (shrub 3 m.; leaves pale green and dull above, subnitid beneath; hypanthium pale coral-red; base of corolla deep crimson, the apex green).

The cited specimens are very typical of the species, which is known from several collections from Pichincha and extends northward into Nariño. Sleumer inadvertently omitted this species from his review of the *Psammisiae* with pinnatinerved leaves (Bot. Jahrb. 71: 403-404. 1941).

*Psammisia oreogenes* Sleumer, Bot. Jahrb. 71: 403. 1941.

Pichincha: Western slope of the cordillera, Cerro Corazón, 8,000-9,300 ft. elev., *Camp E-1677* (vine-like epiphyte; leaves deep green above, pale beneath; at anthesis peduncles deep coral-red and hypanthium pale coral, deeply grooved; base of corolla red, white toward the end, the apex green; bracts and pedicels green; flowers in axils of leaves), *Camp E-1678* (NY only) (epiphytic vine, with flowers on old wood; pedicels deep coral-red, the bracts green; hypanthium pale yellowish coral; lower part of corolla red, the apex green, without white zone noted in no. 1677 but in same stage, the corolla much broader).

In foliage these two specimens appear conspecific, but unfortunately the flowers described for no. 1678 have been lost. Differences can be observed between these plants and the description of *P. oreogenes*, typified by Heilborn 488, also from Pichincha. Dr. Camp's specimens have the petioles slightly longer, the pedicels shorter, more slender, and glandular-pilose distally rather than glabrous, the calyx glandular-strigillose rather than glabrous, the stamens somewhat longer (about 9 mm. long), and the anther-tubules about 5 mm. rather than 2.5-3 mm. long. Our specimens differ from the allied *P. sodiroi* in the merely apiculate calyx-limb, the longer corolla, and in details of venation, in which characters they seem to agree with Sleumer's species.

*Psammisia idalima* A. C. Smith, sp. nov.

Frutex subscandens ubique praeter filamenta glaber, ramulis gracilibus subteretibus fuscis, intermediis bracteis papyraceis lanceolato-oblongas 5-10 mm. longas obtusas interdum gerentibus; petioli crassis subteretibus rugulosis ni-

grescentibus 5-10 mm. longis; laminis in sicco subcoriaceis metallico-olivaceis oblongo-ellipticis, (12-)15-25 cm. longis, (3.5-)5-10 cm. latis, basi late obtusis et in petiolum subito decurrentibus, apice breviter acuminatis, margine leviter recurvatis, pinnatinerviis, costa supra elevata vel superne impressa subtus prominente, nervis lateralibus utrinsecus 5-7 arcuato-adscedentibus anastomosantibus supra subplanis subtus elevatis, rete venularum subimmerso vel utrinque paullo prominulo; inflorescentia axillari vel infra folia enata breviter racemosa 6-9-flora; rhachi angulata 5-10 mm. longa, bracteis sub floribus papyraceis oblongis 2-3 mm. longis obtusis; pedicellis gracilibus sub anthesi 12-18 mm. sub fructu ad 20 mm. longis basim versus bibracteolatis, bracteolis subpapyraceis ovato-deltaeideis 2-2.5 mm. longis circiter 1.5 mm. latis subacutis pauciglanduloso-marginatis; calyce sub anthesi circiter 6 mm. longo et apice 7-8 mm. diametro, tubo cupuliformi circiter 3 mm. longo, limbo papyraceo erecto-patente profunde 5-lobato, lobis oblongo-ovatis 2-3 mm. longis circiter 3 mm. latis praeter apicem apiculatum crasso-marginatis, sinibus acutis; corolla carnea urceolata sub anthesi 7.5-8 mm. longa et basim versus circiter 5 mm. diametro faucibus angustata, lobis 5 oblongis subacutis circiter 1 mm. longis; staminibus 10, filamentis submembranaceis circiter 1 mm. longis interdum superne intus minutissime pilosis in connectivis graciles ecalcaratos angustatis, antheris 3.5-4 mm. longis, thecis circiter 2.5 mm. longis basi incurvatis, tubulis 1-1.5 mm. longis per rimas elongatas dehiscentibus; stylo tereti corollam subaequante, stigmatibus minuto; fructibus subglobosis in sicco coriaceis rugulosis ad 1 cm. diametro calycis limbo persistente et disco coriaceo pulvinateo ad medium depresso coronatis.

Azuay: The eastern Cordillera, 1-8 km. north of the village of Sevilla de Oro, 8,000-9,000 ft. elev., July 27-Aug. 12, 1945, *Camp E-4597* (TYPE US 1,989,098; dupl. NY) (plant vine-like; leaves deep green above, very pale beneath; hypanthium crimson; base of corolla crimson, the apex white; fruit non-glaucous), *Camp E-4379* (vine; leaves deep green and dull above, pale green beneath; pedicels and hypanthium crimson; corolla basally deep pink, apically pale pink to white; immature fruit nitid).

From *P. sodiroi* Hoer., apparently its closest ally, the new species differs in having its leaf-blades slightly thicker in texture and with less prominent venation, its pedicels and calyx more slender, its corolla shorter, and its anthers much shorter and essentially ecalcarate. The small flowers and other obvious combinations of characters readily separate *P. idalima* from other species of this immediate relationship, *P. graebneriana* Hoer., *P. debilis* Sleumer, and *P. oreogenes* Sleumer.

*Psammisia sclerantha* A. C. Smith, sp. nov.

Frutex parvus interdum epiphyticus ubique praeter filamenta glaber, ramulis teretibus gracillimis fusco-stramineis; petiolis inconspicue angulatis 7-15 mm. longis; laminis subcoriaceis in sicco metallico-olivaceis elliptico-lanceolatis, 11-21 cm. longis, 4-6.5 cm. latis, basim versus gradatim angustatis et in petiolum decurrentibus, apice longe et acute acuminatis, margine leviter recurvatis, pinnatinerviis, costa supra paullo subtus valde elevata, nervis lateralibus utrinsecus 4 vel 5 erecto-patentibus anastomosantibus supra subplanis subtus paullo elevatis, venulis utrinque haud prominulis; inflorescentia axillari breviter racemosa 2-7-flora; rhachi gracili obtuse angulata ad 12 mm. longa, bracteis sub floribus papyraceis deltaeideo-oblongis obtusis 1-1.5 mm. longis latisque; pedicellis sub anthesi 13-20 mm. longis superne incrassatis et sub calyce conspicue articulatis basim versus bibracteolatis, bracteolis bracteis similibus minoribus; calyce cupuliformi sub anthesi circiter 6 mm. longo et 8 mm. diametro, tubo brevi et lato, limbo crasso-carnoso erecto-patente 3-4 mm. longo lobis haud 1 mm. longis inconspicue 5-dentato praeter apices lorum obscure crasso-marginato,



sinibus complanatis vel late obtusis; corolla cylindrica sub anthesi 8-9 mm. longa 4-6 mm. diametro superne conspicue crasso-carnosa, lobis 5 deltoideis circiter  $2 \times 2$  mm. acutis sub anthesi inflexis; staminibus 10, filamentis submembranaceis pallidis ligulatis 2-3 mm. longis superne intus obscure puberulis in connectivos latos omnibus obtuse sed manifeste calcaratos transeuntibus, antheris 4.5-6 mm. longis, thecis crassis subquadratis 3.5-4.5 mm. longis basi incurvatis et obtusis in tubulos graciles 1-1.5 mm. longos cum rimis elongatis ovalibus abrupte angustatis; stylo tereti corollam fere aequante stigmatē obscure lobato; fructibus juvenilibus late subglobois ad 1 cm. latis calycis limbo persistente inflexo et disco coriaceo pulvinato coronatis.

Santiago-Zamora: Cordillera Cutucú, ridge between Río Ontza and Río Chupiasa, 4,300-4,700 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1195* (TYPE US 1,989,009; dupl. NY) (leaves deep green above, pale green beneath, dull on both surfaces; pedicels and hypanthium coral-red; corolla green in bud, red as it begins to open, and purple with age). Same locality and altitude, ridge ascending into central Cutucú, *Camp E-1156* (small shrubs 1 m., epiphytic or terrestrial; pedicels and calyx deep coral-red; corolla green, carnose, very hard when open; plants later seen in shade, with nearly white flowers).

*Psammisia sclerantha* is another of the species with pinnatinerved leaves, characterized by having the calyx-limb and distal part of its corolla extraordinarily thick in texture and its anthers with broad, spurred connectives and very short, slender tubules. From *P. sodiroi* Hoer. and the other species of this alliance except *P. oreogenes* Sleumer, the new species differs in its merely denticulate (rather than conspicuously lobed) calyx-limb. *Psammisia oreogenes*, however, has comparatively short-petioled leaves and a differently proportioned calyx (the limb being shorter and thinner) and anthers.

*Psammisia columbiensis* Hoer. Bot. Jahrb. 42: 303. 1909.

Azuay: The eastern Cordillera, 1-8 km. north of the village of Sevilla de Oro, 8,000-9,000 ft. elev., *Camp E-4470* (large vine, scrambling to 7 m.; leaves deep green and dull above, pale and subnitid beneath; peduncles bright green; pedicels red at base, becoming crimson above; hypanthium dull crimson, the calyx-lobes tipped with yellow; corolla doubly constricted, crimson to second constriction, the apex and lobes white; filaments united at base; immature fruit dull green).

I am unable to distinguish the cited specimen from *P. columbiensis*, typified by a specimen from Cauca and also now known from Antioquia and Putumayo in Colombia. The species is characterized by its narrow, few-nerved leaves, its elongate inflorescence, and its flowers of medium size for the genus, with large calyx-lobes and connate filaments. The Camp collection has the filaments only loosely united and the anthers very inconspicuously spurred, these points of difference from typical material being the only ones observed.

Another specimen that should be considered here is: *Camp E-1144* (Santiago-Zamora: Cordillera Cutucú, ridge ascending into central Cutucú, 4,400-4,700 ft. elev., a high-climbing often epiphytic vine; pedicels, calyx, and base of corolla deep coral-red, the apex of corolla white). This specimen differs from no. 4470 and Colombian material of the species in having its leaf-blades thinner in texture and with more obvious venation, and in having its anthers only about 7 mm. (rather than 10-11 mm.) long; the filaments are clearly connate in some flowers and essentially free in others, while the inflorescence is characteristically elongate. Until a more comprehensive suite of specimens of this immediate alliance is available, I hesitate to suggest that more than one species is included, although this may prove to be the case.

*Psammisia guianensis* Kl. *Linnaea* 24: 43. 1851.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, Shell Mera (east of Mera), about 3,500 ft. elev., *Camp E-1703* (in swampy areas, often epiphytic, with arching branches to 3 m. long; inflorescences coral-red, the young corolla white). Santiago-Zamora: Valley of the Río Zamora, east of Loja, ridge across river from the village of Zamora, about 6,500 ft. elev., *Camp E-31* (NY only) (shrub sprawling over rocks). Uplands along Río Upano just north of junction with Río Chupianza, near Mendez, 1,750-2,500 ft. elev., *Camp E-1004* (NY only) (shrubs on ground or on rotting logs, arching to 3 m.). Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), El Partidero, between the Ríos Paute and Negro, 2,100-3,100 ft. elev., *Camp E-1522* (large epiphytic vine, the branches to 6 m.; leaves deep green above, pale beneath; pedicel, hypanthium, and lower part of corolla deep coral-red, the tip of corolla above constricted part white; filaments and connectives white; anthers brown; immature fruit non-glaucous).

The cited specimens agree excellently with other material representing this widespread species from the eastern slopes of the Andes.

*Psammisia ulbrichiana* Hoer. *Bot. Jahrb.* 42: 306. 1909.

Azuay: The eastern cordillera, 1-8 km. north of the village of Sevilla de Oro, 8,000-9,000 ft. elev., *Camp E-4367* (spreading shrub, the branches ultimately vine-like, to 5 m. long; leaves dark green and subnitid above, pale beneath; immature fruit pale salmon), *Camp E-4402* (vine; leaves deep green and nitid above, pale beneath; immature fruit pale salmon). Santiago-Zamora: Cordillera Cutucú, ridge ascending into central Cutucú, 3,500 ft. elev., *Camp E-1102* (NY only) (high-growing epiphyte, the branches arched to 2 m.; leaves deep green above, pale beneath). Same locality, ridge between Ríos Itzintza and Chupiasa, 4,000-4,500 ft. elev., *Camp E-1271* (coarse climbing epiphyte, with branches to 5 m. long).

The cited specimens are all in fruit, but the comparatively large leaves, short inflorescences with congested floral scars, and calycine characters point to their position in *P. ulbrichiana*, typified by a specimen from the Province of Pichincha.

*Psammisia* sp.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, Río Tigre, near junction with the Pastaza (below Topo), 5,400 ft. elev., *Camp E-1693* (epiphyte with branches 5 m. long).

In the shape and texture of its leaves, the cited specimen suggests *P. pauciflora* Griseb. ex A. C. Smith, but its persistent calyx-lobes in fruit are rather large for that species. Flowers are needed satisfactorily to place the specimen.

*Calopteryx sessiliflora* A. C. Smith, sp. nov.

Frutex, ramulis fuscis obtuse angulatis pallide puberulis mox glabratis; stipulis intrapetiolaribus lanceolato-subulatis circiter 7 mm. longis caducis; laminis e ramulis brevibus lateralibus interdum orientibus, ramulis bracteis papyraceis lineari-lanceolatis ad 15 x 2 mm. circumdatis; petiolis incrassatis subteretibus subglabris 5-12 mm. longis; laminis papyraceis in sicco fusco-olivaceis anguste lanceolatis, 13-28 cm. longis, 3.5-7.5 cm. latis, basi late obtusis, in apicem 1-2 cm. longum gradatim angustatis, subtus pilis glandulosis fusco-castaneis 0.2-0.3 mm. longis copiose strigillosis, supra mox glabratis, 5-7-nerviis, nervis secundariis adscendentibus cum costa 2-7 cm. concurrentibus ut costa supra impressis (vel basim versus leviter elevatis) subtus prominentibus, rete venularum supra subimmerso subtus prominulo; inflorescentia ramulis defoliatis enata subfasciculata ut videtur 1- vel 2-flora bracteis numerosis circumdata, bracteis lineari-

lanceolatis obscure glanduloso-marginatis, majoribus circiter  $15 \times 2$  mm., intimis calycem involventibus circiter  $10 \times 3$  mm.; pedicellis subnullis, bracteolis 1 vel 2 lineari-subulatis circiter  $7 \times 0.5$  mm.; calyce 6.5-7 mm. longo et circiter 4 mm. apice diametro pilis minutis glandulosis strigilloso, tubo obtuse 5-angulato circiter 4.5 mm. longo, limbo quam tubo brevior intus glabro fere ad basim 5-lobato, lobis elongato-deltaideis circiter  $3 \times 2$  mm.; disco annulari-pulvinato glabro; corolla tenuiter carnosae parce glanduloso-strigillosoe circiter 13 mm. longa et 4 mm. diametro anguste 5-alata, alis medio circiter 0.7 mm. latis superne angustatis, lobis deltaideis subacutis circiter 1 mm. longis; staminibus 10 corollam subaequantibus, filamentis membranaceis circiter 2.5 mm. longis ut videtur connatis superne obscure puberulo-marginatis, antheris circiter 10.5 mm. longis, thecis 4-4.5 mm. longis basi mucronatis, tubulis quam thecis leviter longioribus per rimas elongatas dehiscentibus; stylo filiformi corollam subaequante, stigmatibus minute peltatis.

Santiago-Zamora: Eastern slope and crest of main Cordillera Cutucú, 5,200 ft. elev., Nov. 25-Dec. 2, 1944, H. Jorgensen CuJ-38 (TYPE US 1,988,919; dupl. NY) (shrub 3 m.; flowers red).

The generic position of this species presents difficulties not unfamiliar in the Andean Vacciniaceae. Although it is clearly of the general affinity of *Thibaudia*, it is perhaps best referred, because of its winged corolla, to the recently described genus *Calopteryx* (Jour. Arnold Arb. 27: 100. 1946), based on a single species from low elevation near the coast in El Valle, Colombia. From the only known species, *C. insignis*, *C. sessiliflora* differs in its leaf-blades with more highly concurrent secondaries, its greatly reduced 1- or 2-flowered inflorescences subtended by conspicuous lanceolate bracts, its subsessile flowers, its much shorter and more narrowly winged corolla, and its anthers with comparatively short tubules. The discovery of this entity certainly weakens the characters which separate *Calopteryx* from *Thibaudia*, but the former concept may perhaps be maintained for the present.

***Thibaudia lateriflora* A. C. Smith, sp. nov.**

Frutex scandens praeter flores ubique glaber, ramulis gracilibus teretibus inferne radicanibus; petiolis gracilibus rugulosis subteretibus 6-8 mm. longis crassis (2-3 mm. diametro); lamina subpapyraceis in sicco fusco-viridibus oblongo-ellipticis, 17-26 cm. longis, 7-10 cm. latis, basi obtusis, apice in acuminem gracilem ad 25 mm. longum subito caudato-attenuatis, margine inconspicue recurvatis, subtus obscure et sparse glanduloso-strigillosis, plerumque 7-nerviis, nervis secundariis adscendentibus cum costa ad 3.5 cm. concurrentibus ut costa supra leviter impressis subtus prominentibus, nervis extimis inconspicuis, rete venularum intricato supra subimmerso subtus prominulo; inflorescentiis in glomerulis ramulis defoliatis enatis aggregatis, bracteis numerosis obscuris suffultis, rhachi gracili minuta haud 2-3 mm. longa ut videtur plerumque uniflora, bracteis floriferis oblongis obtusis 1-2 mm. longis; pedicellis gracilibus 6-8 mm. longis ut calyce obscure puberulis basim versus bibracteolatis, bracteolis oblongis obtusis 1-1.5 mm. longis; calyce turbinato cum pedicello continuo sub anthesi 4-5.5 mm. longo et apice circiter 3 mm. diametro, obscure albedo-puberulo etiam inconspicue glanduloso-strigilloso, tubo alis carnosis haud 0.3 mm. latis inconspicue alato, limbo erecto 1-1.5 mm. longo, lobis 5 inconspicuis ovato-denticulatis haud 0.5 mm. longis, sinibus obtusis; corolla tenuiter carnosae 5-angulatae (angulis subalatis alis haud 0.2 mm. latis) sub anthesi 19-22 mm. longa circiter 4.5 mm. diametro obscure puberula mox glabrata, lobis 5 oblongis circiter 1.5 mm. longis; staminibus 10 corollam subaequantibus, filamentis ligulatis subcohaerentibus circiter 3

mm. longis margine superne obscure puberulis, antheris 18-19 mm. longis, thecis levibus 10-11 mm. longis, tubulis 8-9 mm. longis per rimas elongatas dehiscentibus; stylo filiformi leviter exserto, stigmatibus minute peltatis.

Santiago-Zamora: Cordillera Cutucú, ridge ascending into central Cutucú, 2,600 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1141* (coll. F. Prieto) (TYPE NY; dupl. US) (climbing; leaves dark green above, paler and shining beneath; calyx green-ribbed; corolla ribbed, crimson toward base, bright green distally).

The fact that the calyx is continuous with the pedicel suggests that this species is an ally of the widespread *T. floribunda* H. B. K., from which it differs in such obvious respects as its broader leaves, greatly reduced and glomerulate inflorescences, narrowly winged calyx and corolla, and longer corolla and stamens. That the corolla is winged (although very obscurely so) indicates an affinity of the new species with *Anthopterus* Hook., where, however, the wings are obvious and manifestly veined. From another allied genus, *Calopteryx* A. C. Smith, *T. lateriflora* is excluded by its continuous calyx and also by its very narrow corolla wings. The discovery of such new species as this and the above-described *Calopteryx sessiliflora*, however, suggests that the winged corolla cannot be safely utilized as a character of generic value in the family.

*Thibaudia clivalis* A. C. Smith, sp. nov.

Frutex epiphyticus ubique praeter antheras glaber, ramulis gracilibus junioribus obtuse angulatis vetustioribus teretibus; foliis subsessilibus, petioli 1.5-3 mm. longis, laminis coriaceis subbullatis in sicco fusco-brunneis, oblongis vel obovato-oblongis 7.5-12.5 cm. longis, 4-8 cm. latis, basi manifeste cordatis et subauriculatis, apice rotundatis, margine recurvatis et sinuato-crenatis, costa valida supra sulcata vel basim versus elevata subtus prominente, nervis lateralibus utrinsecus 3-5 supra impressis subtus valde elevatis, eis basim versus validioribus curvato-ascendentibus, rete venularum conspicuo utrinque obtuse prominulo; inflorescentia completa non visa; pedicellis teretibus rugulosis ante anthesin circiter 10 mm. longis basi bibracteolatis superne incrassatis, articulatione conspicuo, bracteolis pentagonis circiter 2.5 mm. longis latisque subacutis; calyce turbinato 6-6.5 mm. longo apice 4-5 mm. diametro, tubo ruguloso obtuse angulato circiter 2.5 mm. longo, limbo suberecto carnosissimo quam tubo longiore 5-lobato, lobis late deltoideo-ovatis circiter 1 x 2 mm. apiculatis, sinibus obtusis; corolla (videtur paullo ante anthesin) urceolato-cylindrica carnosissima 8-9 mm. longa basim versus circiter 4 mm. diametro superne angustata, lobis 5 deltoideis circiter 1 mm. longis acutis; staminibus 10, filamentis liberis ligulatis minutis ad 1 mm. longis margine superne pilosis, connectivis alternatis margine copiose albido-villosis (pilis circiter 0.5 mm. longis), alteris obscure puberulis, antheris circiter 6 mm. longis, thecis basi obtusis, tubulis quam thecis paullo brevioribus per rimas ovales magnas dehiscentibus; stylo tereti corollam subaequante truncato.

Santiago-Zamora: Cordillera Cutucú, east-trending slope from top of ridge down toward the Itzintza, 4,800-5,800 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1384* (TYPE NY) (epiphyte; leaves dark green above, paler beneath, the veins red; young flowers pink).

Although the cited specimen is not entirely satisfactory, lacking attached or complete inflorescences, it obviously represents an undescribed species of *Thibaudia*. In its apparently rigidly carnosose corolla, free filaments, erect elongate calyx-limb, and leaf-texture it suggests the Peruvian *T. engleriana* Hoer. From that species, however, *T. clivalis* differs in having its branchlets less sharply angled and its leaves subsessile, larger, and more deeply cordate at base. The flowers of the new species are not entirely mature, but they are comparatively

small, with much shorter calyx-lobes, corollas, and stamens. Another species of this alliance, *T. cardiophylla* Sleumer, also of Peru, has the leaves smaller than those of the new species and the pedicels and comparatively large calyx densely pubescent.

*Thibaudia martiniana* A. C. Smith, sp. nov.

Frutex ubique filamentis exceptis glaber, ramis elongatis, ramulis robustis fuscis obtuse angulatis; petiolis crassis (3-5 mm. diametro) 13-20 mm. longis manifeste angulatis; laminis coriaceis in sicco fusco-olivaceis ovato-ellipticis, 20-30 cm. longis, 10-17 cm. latis, basi obtusis et in petiolum decurrentibus, apice ut videtur acutis vel breviter cuspidatis, margine integris et leviter recurvatis, pinnatinerviis, costa supra paullo subtus valde prominente, nervis secundariis utrinsecus plerumque 3 curvatis supra conspicue impressis subtus prominentibus, rete venularum supra subplano vel prominulo vel leviter impresso subtus conspicuo; inflorescentiis axillaribus breviter racemosis circiter 10-floris sed floribus saepe caducis, rhachi crassa superne angulata circiter 1.5 cm. longa, bracteis caducis; pedicellis rugulosis sub anthesi 20-23 mm. longis superne valde incrassatis basim versus bibracteolatis, bracteolis ovato-deltaideis obtusis circiter 2 mm. longis, articulatione conspicuo; calyce coriaceo ruguloso cupuliformi-cylindrico sub anthesi haud apophysato 8-10 mm. longo apice 6-10 mm. diametro, tubo circiter 4 mm. longo, limbo suberecto quam tubo longiore inconspicue 5-dentato, dentibus minute apiculatis haud 0.5 mm. longis, sinibus complanatis; disco carnosopulvinato; corolla crasso-carnosa cylindrica sub anthesi circiter 25 mm. longa et basim versus 7 mm. diametro, superne gradatim angustata, lobis 5 deltaideis obtusis circiter 1.5 x 2.5 mm.; staminibus 10 corollam subaequantibus, filamentis liberis fuscis ligulatis circiter 5 mm. longis intus superne puberulis, antheris circiter 23 mm. longis crassis basi obtusis, thecis in tubulos 7-8 mm. longos inferne lateraliter connatos rimis elongatis dehiscentes gradatim transeuntibus; stylo crasso sub anthesi leviter exserto, stigmate obscure papilloso.

Pichincha: Along the road from Quito to Sto. Domingo de los Colorados (western slope of the cordillera), 8,500-9,500 ft. elev., Jan. 15, 1945, *Camp E-1717* (TYPE US 1,989,049; dupl. NY) (on banks in soil; branches arching to 4 m.; leaves dark green above, pale beneath, dull on both surfaces; pedicels red, the bracteoles white, the "joint" green; calyx red; corolla pure white).

At the suggestion of the collector, this new species is named for Dr. William E. Martin, of the University of California, in whose company the type specimen was obtained. It is closely related only to *T. pachypoda* A. C. Smith, known from low elevations near the coast of El Valle, Colombia, but it differs in its more robust foliage, the leaf-blades being much larger and with more prominent secondary nerves. The new species also has shorter pedicels, a slightly shorter corolla, and anthers with short tubules which are laterally adnate nearly to the apex.

Another collection which may be mentioned here is *Camp E-626* (NY only), from El Oro, in Moro-Moro region about 21 miles west of Portovelo, 3,400-4,200 ft. elev. (coarse shrub with branches to 3 m. long, in dense rain-forest). As compared with the type of *T. martiniana*, no. 626, which is past anthesis, has shorter petioles, pedicels up to 33 mm. long, and a shorter calyx-limb with more obvious lobes. Without corroborating evidence from the corolla and stamens, I hesitate to expand the concept of the new species to include this specimen, although it does not suggest any other known species.

*Thibaudia parvifolia* (Benth.) Hoer. Bot. Jahrb. 42: 275. 1909.

Azuay: "Oriente" Border, crest of Eastern Cordillera, between Oña and the Río Yacuambi, 10,000-11,200 ft. elev., *F. Prieto P-305* (shrub 2 m.; leaves deep

green above, bright green beneath, nitid on both surfaces; pedicels stout, green to red-tinged; hypanthium green to dull red; corolla dull reddish to deep crimson, pale distally; hypanthium and corolla with scattered gland-hairs).

The species has apparently not otherwise been reported from Ecuador, but the cited specimen agrees excellently with *Lehmann 2143* (US), from the type locality in Cauca, Colombia, and with several specimens recently obtained by Dr. Cuatrecasas in the Departments of Cauca and El Valle.

*Thibaudia jorgensenii* A. C. Smith, sp. nov.

Frutex parvus, ramulis gracilibus, junioribus obtuse angulatis pilis albidis circiter 0.5 mm. longis indutis, demum teretibus glabrescentibus; stipulis intrapetiolaribus subulatis circiter 2 mm. longis parce pilosis; petiolis subteretibus rugulosis 2-4 mm. longis ut ramulis mox glabratis; laminis coriaceis in sicco fuscis ovatis, 1.5-3 cm. longis, 0.8-1.5 cm. latis, basi leviter sed manifeste cordatis, apice obtusis, margine incrassatis et inconspicue crenulatis, supra copiose minute albido-punctatis, subtus parce et inconspicue glanduloso-strigillosis, e basi obscure 3-nerviis, costa supra subplana subtus paullo elevata, nervis aliis basalibus et 1 vel 2 paribus e costa orientibus obscuris et immersis; inflorescentia apices ramulorum versus axillari subfasciculata ut videtur pluriflora bracteis imbricatis papyraceis pluribus suborbicularibus obscure piloso-marginatis maximis ad 7 mm. longis basi circumdata; pedicellis subteretibus 1-2 mm. longis pilis albidis 0.3-0.5 mm. longis copiose patentipilosis, basi bibracteolatis, bracteolis lineari-oblongis circiter 3 mm. longis margine ciliatis etiam parce glanduloso-pilosis caducis, articulatione manifesto; calyce campanulato sub anthesi circiter 9 mm. longo et apice diametro, tubo parvo haud 2 mm. longo ut pedicello copiose piloso, limbo erecto-patente papyraceo utrinque glabro vel extus inferne parce piloso profunde 5-lobato, lobis ovatis circiter 5 mm. longis (post anthesin ad 8 mm. accrescentibus) 2.5-4 mm. latis imbricatis manifeste nervatis acutis pilos glandulosos circiter 0.5 mm. longos margine gerentibus; corolla tenuiter carnosa cylindrica circiter 10 mm. longa et 4 mm. diametro utroque paullo angustata, extus ut calycis tubo copiose patentipilosa, lobis 5 deltoideis subacutis circiter 1 mm. longis; staminibus 10 circiter 7 mm. longis, filamentis liberis ligulatis 2.5-3 mm. longis superne angustatis et margine pilosis, antheris 4.5-5 mm. longis, thecis tubulos longitudine subaequantibus basi inflexis et mucronulatis, rimis ovalibus circiter 1 mm. longis; stylo gracili corollam subaequante, stigmatibus minute peltatis.

Loja: Hda. Anganuma, at headwaters of Río Cachiyaçu, on west slopes of Cordillera Condor, about 46 km. south of Loja, 9,400 ft. elev., July 13-16, 1944, *H. Jorgensen & F. Prieto JP-47* (TYPE NY) (shrub, in sotobosque; leaves shining and deep green above, paler beneath; calyx deep pink to red; corolla white).

The available material of the new species is not entirely satisfactory, but one good mature flower has been dissected. Because of its free filaments, the species would be sought among those numbered 10 to 18 in my key of 1932 (*Contr. U. S. Nat. Herb.* 28: 411), but its relationship is certainly with *T. anomala* A. C. Sm., based on an André collection without detailed locality. From this, *T. jorgensenii* differs in its leaf-blades with subcordate bases and its sessile flowers with free filaments; *T. anomala* has the indument of the flowers much denser, covering even the calyx-limb, which in the new species is essentially glabrous.

*Cavendishia striata* A. C. Smith, *Jour. Arnold Arb.* 27: 104. 1946.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, between Baños and Mera, 3,500-5,000 ft. elev., *Camp E-2391* (NY only) (spreading shrub, terrestrial, up to 1 m. high; leaves pale green; bracts pinkish; flower-buds white). Santiago-Zamora: Cordillera Cutucú, on banks of Río Itzintza, 3,500 ft. elev.,

*Camp E-1207* (NY only) (short-branched epiphyte; bracts flushed with pink; hypanthium greenish, the calyx-lobes white; corolla deep purple toward base, white above).

This recently described species, occurring, like many others of the family, over a wide altitudinal belt in Pacific Colombia, has already been recorded from the Province of Pichincha but not elsewhere in Ecuador. In Colombia it occurs from near sea-level up to 2,000 m. The cited specimens both have very young inflorescences but present no important points of difference from Colombian material; under very high magnification the young bracteoles, calyces, and corollas are seen to be copiously glandular with minute spherical sessile glands.

*Cavendishia pseudospicata* Sleumer, Bot. Jahrb. 71: 406. 1941.

Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, Shell Mera (east of Mera), about 3,500 ft. elev., *Camp E-1702* (on steep bank, the branches drooping to 8 ft.; also seen as an epiphyte; ripe fruit purple-black, insipid).

The cited specimen, in fruit, agrees excellently, in general, with Sleumer's species, collected in the same region. However, the indument described by Sleumer appears to be fugacious, if my identification is correct. The following differences of no. 1702 from the original description should be noted: leaf-blades slightly larger (up to  $10 \times 3.5$  cm.); inflorescence (except corolla, not seen) essentially glabrous in fruit except for a few scattered appressed glandular hairs; rachis slightly longer (to 11 cm. long).

*Cavendishia bracteata* (R. & P.) Hoer. Bot. Jahrb. 42: 280. 1909.

*Thibaudia bracteata* R. & P. Fl. Peruv. Chil. 4: pl. 388. 1802, ex J. St.-Hil.

Expos. Fam. Nat. 1: 363. 1805.

*Proclešia hartwegiana* Kl. Linnaea 24: 35. 1851.

*Cavendishia hartwegiana* Hoer. Bot. Jahrb. 42: 489. 1909.

Carchi: Cañon between San Gabriel and Bolivar, *Camp E-375*. Tungurahua: Along Río Pastaza just west of Baños, *Camp E-2367*. Cañar: North rim of the valley of the Río de Cañar, between Suscal and Chontamarca, *Camp E-2890* (coll. M. Giler). Valley of Río de Cañar at Abadel, below town of Galleturo, *Prieto CP-33*. Azuay: Numerous localities, *Camp E-411*, *E-553*, *E-1984*, *E-2178*, *E-3936*, *E-4495*, *E-4892*, *E-5013*. Loja: Cerro Villanaco (about 7 km. west of the city of Loja), *Camp E-186-E-196* incl., *E-682*. Nudo de Cajanuma, 7 km. south of Loja, *Camp E-114*, *E-115*. Crest of the Cordillera de Zamora, east of Loja, *Camp E-93*, *E-94*, *E-103*. Napo-Pastaza: Valley of the Río Pastaza and adjacent uplands, near El Topo, along trail to La Gloria, *Camp E-2400*. Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza, near mouth of Río Patos, *Camp E-754*.

The extensive suite of specimens cited above (without detailed notes on precise locality, habit, habitat, and color, since such notes are too abundant for inclusion here) demonstrates considerable variation, and yet I hardly see how it can be referred to more than a single species. The material is from shrubs up to 5 m. high, taken at elevations from 4,000 to 10,000 ft., and the corolla color is uniformly noted as red to crimson below, yellow or greenish yellow at apex. The most striking variations are seen in the indument of corolla and calyx, and in the density of glands on the calyx, pedicels, bracts, etc. The corolla, in particular, varies from copiously white-pilose with short spreading hairs to entirely glabrous. Of particular value is Dr. Camp's series numbered *E-186-E-196* inclusive, taken from plants in the same colony, demonstrating the instability of these characters.

In my treatment of 1932 (Contr. U. S. Nat. Herb. 28: 489 et seq.) I expressed uncertainty as to the biological validity of several species of this alliance, and *C. hartwegiana* in that work was keyed with both the pubescent- and the glabrous-

flowered species. It now seems quite impossible to maintain *C. bartwegiana* as distinct from *C. bracteata*. The accumulation of herbarium material in the past twenty years has furthermore served to weaken the supposed distinctions between *C. bracteata* and several other of its allies. One may question the advisability of maintaining such species as *C. beckmanniana* Hoer. (1909), *C. scabriuscula* (H. B. K.) Hoer. (based on *Thibaudia scabriuscula* H. B. K., 1818), and *C. micronioides* A. C. Smith (based on *Thibaudia melastomoides* H. B. K., 1818). The complex of which these entities are a part (whether as species or taxa of lesser rank) extends from Colombia to Bolivia.

It should also be considered whether the *C. bracteata* complex can be specifically kept apart from *C. strobilifera* (H. B. K.) Hoer. (based on *Thibaudia strobilifera* H. B. K., 1818), to which I have already reduced many comparatively recent specific concepts (i. e. to *C. acuminata*, op. cit. 503-505). Certainly I should now refer to *C. bracteata* several of the Ecuadorian collections which in 1932 I cited as *C. acuminata*.

The problems of relationships in this group of *Cavendishia* can probably not be solved without analysis in the field. In referring Dr. Camp's material to *C. bracteata* I make use of the oldest specific epithet for the complex.

***Cavendishia strobilifera*** (H. B. K.) Hoer. Bot. Jahrb. 42: 279. 1909.

Pichincha: Western slope of the cordillera, along the road from Quito to Sto. Domingo de los Colorados, 7,000-10,000 ft. elev., *Camp E-1720* (abundant shrub 0.3-2.5 m.; bracts crimson; hypanthium red; corolla crimson except for pale yellow apex; ripe fruit purple-black, shining).

As implied above in my discussion of *C. bracteata* (R. & P.) Hoer., the differences between that and *C. strobilifera* are not very convincing. Since the character of corolla-pubescence is seen to be of little use, only the somewhat larger leaves with definitely long-acuminate apices serve to keep the present species apart.

***Cavendishia capitata*** (Benth.) Hoer. Bot. Jahrb. 42: 279. 1909.

Loja: "Oriente" Border, crest of the Cordillera de Zamora, east of Loja, ca. 10,000 ft. elev., *Camp E-102* (growing in soil; spreading shrub to 2 m. high; bracts red; corolla white). Santiago-Zamora: Valley of the Río Zamora, east of Loja, ridge across river from village of Zamora, 6,500 ft. elev., *Camp E-42*. Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Tres Ranchos and Chontal, 2,700-5,700 ft. elev., *Camp E-1557* (great mounds of canes on bank, probably starting as windfall; leaves shining on both surfaces; bracts crimson; corolla white).

The cited specimens agree excellently with the type, from the Province of Loja. The collections discussed here represent the only additional material of the species known to me. The species is characterized by its essentially glabrous habit, comparatively large leaves and flowers, short pedicels with conspicuous bracteoles, glandular calyx-limb, and comparatively long glandular-margined calyx-lobes. The three cited collections permit some amplification of my earlier description (Contr. U. S. Nat. Herb. 28: 507. 1932), as follows:

Leaf-blades (9-)12-19 cm. long, (3.5-)4.5-8.5 cm. broad, 7- or 9-nerved from near base but the outer 2 or 4 nerves often very inconspicuous; pedicels 2-5 mm. long, sometimes with a few scattered minute spherical glands, bibracteolate toward base, the bracteoles linear-oblong, obtuse, 4.5-6 × 1-1.5 mm., glandular-margined and sometimes glandular on both surfaces distally; calyx at anthesis up to 13 mm. long and 9 mm. in diameter at apex, the tube angled, up to 7 mm. long, the limb 3-6 mm. long, bearing superficial spherical glands without, the lobes 2.5-5 × 3-4 mm., glandular-margined, the sinuses rounded or obtuse; corolla



22-30 mm. long (as previously described), 4-7 mm. in diameter; filaments alternately 3.5-5 mm. and 6-8.5 mm. long, the anthers alternately 18-19 mm. and 15-17 mm. long, with thecae 5-7 mm. long.

The following three specimens should also be considered as representing *C. capitata*, although they are not strictly typical:

Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Hda. Chontal and Sta. Elena, 3,400-4,600 ft. elev., *Camp E-804* (NY only) (arching shrub, often seen epiphytic; bracts red; corolla pale pink, distally white). Cordillera Cutucú, ridge just south and west of Río Itzintza, 5,900 ft. elev., *Camp E-1347* (NY only) (on soil in moss; fruit black at maturity, insipid). Eastern slope and crest of main Cordillera Cutucú, 5,500 ft. elev., *Jorgensen CuJ-43* (shrub 3 m.; corolla red).

These specimens have the inflorescence precisely as in typical *C. capitata*, except that the pedicellary bracteoles are inclined to be slightly smaller (2.5-3.5 mm. long). The leaf-blades are comparatively narrow and lanceolate-oblong, 8-13 cm. long and 3-4 cm. broad, being sometimes only 5-nerved. These differences are so inconsequential that a reasonable species-concept for *C. capitata* may include all six specimens cited above.

***Cavendishia campii* A. C. Smith, sp. nov.**

Frutex ad 4 m. altus, ramulis fuscis subteretibus apicem versus pilis albidis 0.2-0.5 mm. longis indutis demum glabratis; petiolis rugulosis 7-11 mm. longis ut ramulis pilosis; laminis coriaceis in sicco fusco-olivaceis oblongo-ellipticis, 8-17 cm. longis, 2.5-6 cm. latis, basi anguste rotundatis vel obtusis, in acuminem gracilem subacutum 1-2 cm. longum angustatis, margine recurvatis, supra glabris vel basim versus obscure pilosis, subtus pilis castaneis circiter 0.2 mm. longis e basi incrassato adpressis copiose strigillosis ac etiam secus nervos albidohispidulis, 5(vel obscure 7-)nerviis, nervis secundariis basi (raro ad 1 cm. concurrentibus) orientibus ut costa supra impressis subtus prominentibus, rete venularum supra plano subtus obscuro; inflorescentia axillari compacta plerumque 8-12-flora bracteis numerosis papyraceis glabris oblongis ad 2.5 cm. longis basi circumdata, bracteis extimis (minimis) dorso parce pilosis, rhachi crassa 0.5-2 cm. longa mox glabra; pedicellis rugulosis sub anthesi 4-9 mm. longis parce pilosis glabrescentibus, basim versus bibracteolatis, bracteolis lanceolato-oblongis subacutis circiter 4 mm. longis glabris vel obscure glanduloso-marginatis; calyce sub anthesi 6-9 mm. longo et apice 5-6 mm. diametro extus albido-piloso et interdum minute glanduloso, tubo oblongo obtuse angulato 4-5 mm. longo, limbo erecto 2-5 mm. longo 5-lobato, lobis deltoideis 1.5-3 x 2-3 mm. subacutis interdum glanduloso-marginatis, sinibus acutis vel obtusis; corolla tenuiter camosa cylindrica sub anthesi 15-21 mm. longa et 4-5.5 mm. diametro praeter basim et apicem pilis 0.3-0.4 mm. longis patentibus ornata, lobis oblongis obtusis circiter 1 mm. longis; staminibus alternatim 13-14 mm. et 15-16 mm. longis, filamentis liberis gracilibus alternatim 2.5-3 mm. et 5-5.5 mm. longis superne pilosis, antheris alternatim circiter 12 mm. et 11 mm. longis, thecis 3-5 mm. longis; stylo corollam subaequante.

Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Hda. Chontal and Sta. Elena, 3,400-4,600 ft. elev., Nov. 1, 1944, *Camp E-803* (TYPE US 1,989,003; dupl. NY) (shrub 3 m.; bracts deep pink; corolla red), *Camp E-785* (NY only) (arching shrub 4 m.; bracts deep pink). Azuay: The eastern Cordillera, 1-8 km. north of the village of Sevilla de Oro, 8,000-9,000 ft. elev., *Camp E-4350* (coarse shrub, with branches to 4 m.; leaves deep green and nitid above, paler beneath; bracts pink; base of corolla pale pink, central portion deep pink to pale rose,

apex white). Quebradas leading into the Río Collay, 3-8 km. north of Sevilla de Oro, 7,000-8,300 ft. elev., *Camp E-5007* (sprawling shrub 3 m.; leaves deep green above, pale beneath, subnitid on both surfaces; bracts pale pink; corolla basally pink, apically white).

In my key to the genus (*Contr. U. S. Nat. Herb.* 28: 463-467. 1932) this species would be sought in the vicinity of *C. pubescens* (H. B. K.) Hemsl., from which it differs in its less copious indument, generally smaller leaves, more compact inflorescence, and smaller flowers with less conspicuous calyx-lobes. However, the new species is probably more closely allied to *C. capitata* (Benth.) Hoer., discussed above. From the typical form of *C. capitata*, *C. campii* differs in the pubescence of its vegetative parts and flowers, its prevailing smaller leaves, longer pedicels with smaller bracteoles, eglandular (or sparsely glandular) calyx, and distinctly shorter corolla and stamens. Variability in pubescence is marked in some species of *Cavendishia* (see discussion of *C. bracteata*, above), but the combination of characters marking *C. campii* seems reasonably adequate, although admittedly specific lines in this group of *Cavendishia* are somewhat arbitrary and in need of field analysis. Another species of this alliance, the Peruvian *C. ulei* Hoer., has its leaf-blades distinctly 7-nerved and with comparatively highly concurrent nerves, and lacks the characteristic white pubescence of *C. campii*.

*Cavendishia zamorensis* A. C. Smith, sp. nov.

Frutex epiphyticus, ramulis crassis glabris in sicco pallidis striatis; petiolis subteretibus rugulosis glabris 5-10 mm. longis; laminis subcoriaceis siccitate metallico-olivaceis ellipticis, 11-15 cm. longis, 5-9 cm. latis, basi rotundatis, in acuminem subacutum ad 15 mm. longum subito angustatis, margine recurvatis, supra glabris, subrus minute glanduloso-strigillosis, 7 (vel obscure 9-) nerviis, nervis (intimis interdum ad 2 cm. cum costa concurrentibus) et costa supra impressis (vel basim versus elevatis) subtus prominentibus, rete venularum utrinque haud prominulo; inflorescentia apices ramulorum versus axillari subcapitata, ubique praeter filamentas glabra, bracteis papyraceis suborbicularibus rotundatis margine scariosis maximis ad 2 cm. diametro basi circumdata, rhachi brevi, floribus numerosis congestis; pedicellis incrassatis sub anthesi 2-3 mm. longis parce glandulosis basim versus bibracteolatis, bracteolis submembranaceis oblongo-ellipticis 5-6 mm. longis circiter 4 mm. latis apice rotundatis utrinque parce glanduloso-strigillosis tubum calycis involventibus; calyce sub anthesi circiter 10 mm. longo et apice diametro, tubo obtuse angulato circiter 3 mm. longo, limbo erecto-patente quam tubo longiore superne parce glanduloso-strigilloso profunde 5-lobato, lobis elliptico-oblongis basi imbricatis 6-7 mm. longis 4-5 mm. latis apice rotundatis margine scariosis et pauci-glandulosis; corolla carnosae urceolato-cylindrica sub anthesi 13-14 mm. longa et circiter 7 mm. diametro, superne angustata, lobis deltoideis obtusis circiter 1 mm. longis; staminibus circiter 11 mm. longis, filamentis ligulatis alternatim circiter 2 mm. et 3.5 mm. longis superne intus obscure pilosis, antheris alternatim circiter 11 mm. et 10 mm. longis, thecis 4-5 mm. longis; stylo tereti corollam subaequante, stigmatem minuto.

Santiago-Zamora: Valley of the Río Zamora, east of Loja, near Zamora, about 3,000 ft. elev., June 28-July 1, 1944, *Camp E-2* (TYPE US 1,988,931; dupl. NY) (epiphyte on trees over river; bracts deep pink to crimson; corolla white).

In its imbricate calyx-lobes, *C. zamorensis* suggests a relationship with such Colombian species as the recently described *C. tenella* A. C. Smith (*Jour. Arnold Arb.* 27: 106. 1946), from which it differs in its short-petiolate leaves with rounded bases, compact and comparatively few-flowered inflorescences, large pedicellary bracteoles, and slightly larger flowers. A specimen which may best be referred to

the new species, but the variations of which are not included in the above description, is *Camp E-29* (NY only) (same locality as type, ridge across the river from the village of Zamora, 6,500 ft. elev.; epiphytic shrub with branches to 3 m.; bracts deep pink; flowers pale pink). From the type this specimen differs in having the pedicellary bracteoles only 1.5 mm. broad and consequently not clasping the calyx, the calyx-lobes only 2.5-3 mm. broad, very narrowly imbricate, and more copiously glandular at margin, the corolla 19-22 mm. long, the stamens about 15 mm. long, with filaments alternately about 2.5 mm. and 5 mm. long and stamens about 13 mm. and 11 mm. long respectively. This variant seems to point toward a relationship of *C. zamorensis* with *C. capitata*, which occurs more commonly in the area, as noted above. The type of the new species, at least, seems to represent an entity worthy of specific rank, differing from typical *C. capitata* in its broad bracteoles and calyx-lobes and its short corolla and stamens.

*Cavendishia orthosepala* A. C. Smith, sp. nov.

Frutex epiphyticus, ramulis subteretibus pilis albidis circiter 0.5 mm. longis patentibus indutis demum glabratis; petiolis validis teretibus 7-13 mm. longis ut ramulis pilosis; laminis subcoriaceis plus minusve bullatis in sicco fusco-metallicis oblongo-ellipticis, (11-)15-26 cm. longis, (3-)4-9 cm. latis, basi rotundatis vel late obtusis, in acuminem subacutum 10-15 mm. longum subito angustatis, margine valde recurvatis, supra primo pilosis, subtus ut ramulis copiose albido-pilosis ac etiam pilis castaneis glandulosis circiter 0.2 mm. longis a basi incrassato adpressis strigillosis, plerumque 7-nerviis, nervis (intimis ad 3 cm. cum costa concurrentibus) et costa supra conspicue impressis subtus prominentibus, venulis utrinque subprominulis; inflorescentia subterminali breviter racemosa multiflora, bracteis papyraceis obovato-oblongis rotundatis margine scariosis maximis circiter 25 mm. longis basi circumdata, bracteis extimis (minimis) dorso pilosis ceteris glabris, rhachi post anthesin ad 3 cm. longa glabra; pedicellis incrassatis teretibus obscure glanduloso-strigillosis 3-5 mm. longis basi conspicue bibracteolatis, bracteolis papyraceis obovato-ellipticis 12-16 mm. longis 3-6.5 mm. latis apice rotundatis vel emarginatis et parce glandulosis margine scariosis dorso glanduloso-strigillosis tubum calycis involventibus; calyce post anthesin 15-17 mm. longo extus pilis albidis 0.4-0.7 mm. longis copiose induto, tubo cupuliformi circiter 5 mm. longo et diametro, limbo erecto fere ad basim profunde 5-lobato, lobis subcoriaceis anguste oblongis 10-12 mm. longis 2-3 mm. latis basi anguste imbricatis apice subacutis intus glabris glanduloso-strigillosis; corolla filamentisque non visis, antheris circiter 10 mm. longis, tubulis thecas longitudine subaequantibus; stylo filiformi circiter 16 mm. longo, stigmatate minuto.

Santiago-Zamora: Cordillera Cutucú, on banks of Río Itzintza, 3,500 ft. elev., Nov. 17-Dec. 5, 1944, *Camp E-1201* (TYPE US 1,989,011; dupl. NY) (epiphyte; leaves deep green and shining above, paler and dull beneath; inflorescence up to 24-flowered; outer bracts deep red, the inner bracts pink to red; fruit white). Same locality, ridge between Ríos Itzintza and Chupiasa, 4,000-4,500 ft. elev., *Camp E-1278* (vine-like epiphyte, in tree thrown by storm; leaves deep green above, paler beneath, with markedly translucent veins; bracts crimson; hypanthium turning cream-white, the calyx-lobes crimson).

The remarkably developed pedicellary bracteoles and calyx-lobes of the new species are so unique in *Cavendishia* that comparisons with other species are superfluous. A tendency in this direction is noted in the above described *C. zamorensis*, which differs from *C. orthosepala* in the lesser development of these parts and in obvious characters of pubescence, but which may be its closest relative. The new species suggests *C. pubescens* (H. B. K.) Hemsl. in foliage,

but inflorescence differences are numerous and obvious. No corollas are available for the new species, but dimensions of the style and a few anthers (with no. 1278) indicate a corolla about 16 mm. long.

*Cavendishia* sp.

Santiago-Zamora: Cordillera Cutucú, ridge ascending into central Cutucú, 4,400-4,700 ft. elev., *Camp E-1157* (NY only) (epiphyte, arching to 2 m.; calyx fluted and ribbed; corolla pale, tipped with crimson).

The cited plant appears to represent an undescribed species, but unfortunately the corollas described in the field notes are not now with the unicate specimen. Its relationship is with the species of *Cavendishia* with an elongate calyx-limb and callose-thickened lobes (see sp. 5-9 in my key in *Contr. U. S. Nat. Herb.* 28: 463. 1932).

*Orthaea secundiflora* (Poepp. & Endl.) Kl. *Linnaea* 24: 24. 1851.

Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Hda. Chontal and Sta. Elena, 3,400-4,600 ft. elev., *Camp E-783* (coarse epiphyte, hanging lax to 6 m.; new leaves bright pink, conspicuous in the forest; corolla deep crimson, in bud pale pink, apically white); same locality, *Camp E-799* (arching shrub 4 m.; corolla crimson below, apically white).

These collections, the first of the species recorded from Ecuador, agree excellently with the original description and plate (*Thibaudia secundiflora* Poepp. & Endl. *Nov. Gen. & Sp.* 1: 5. *pl.* 9. 1835). The type material of the species was obtained in the present Department of Huánuco, Peru.

*Orthaea* sp.

Santiago-Zamora: Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), region of Tambo Pilas, near mouth of Río Patos, 6,500-7,500 ft. elev., *Camp E-757* (shrub 4 m.; leaves shining on both sides, somewhat paler beneath; corolla pale pink below, apically white).

The cited specimen differs from *O. secundiflora* in its congested inflorescences (rachis 5-8 mm. long; pedicels about the same length), and its stamens with free filaments and slightly shorter anthers. It may be referable to *O. abbreviata* Drake, from southern Ecuador, but the inadequate description of that species (*Jour. de Bot.* 3: 75. 1889) implies that its leaves are somewhat broader (7 x 3 cm.) and its pedicels are 2 cm. long. Number 757 cannot be positively identified without comparison with the type of *O. abbreviata*.

*Satyria panurensis* (Benth.) Benth. & Hook. *Gen. Pl.* 2: 568. 1876.

Santiago-Zamora: Low hills west of Río Upano, along Río Chupiangias, 2,500-3,200 ft. elev., *F. Prieto ChuP-24* (epiphytic, vinelike; young leaves red; corolla red, green at apex).

Widespread in the Andean foothills from Peru to Venezuela and into British Guiana, but not, so far as I know, previously recorded from Ecuador.

*Satyria leucostoma* Sleumer, *Bot. Jahrb.* 71: 407. 1941.

Santiago-Zamora: Cordillera Cutucú, ridge ascending into central Cutucú, 4,400-4,700 ft. elev., *Camp E-1146* (climbing, or high epiphyte; pedicels and hypanthium green; base of corolla crimson, the apex white; leaves dull beneath). Eastern slope of the cordillera, valley of the Ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), between Tres Ranchos and Chontal, 2,700-5,700 ft. elev., *Camp E-1558* (epiphyte; leaves deep green above, pale beneath; pedicels and hypanthium green; base of corolla red, the apex white).

Although type material of Sleumer's species is not available, the cited specimens agree excellently with the original description, based on *Schultze-Rhonhof 3010*, also collected in the Oriente of Ecuador. Some of the leaf-blades of the Camp material, probably from older parts of the plant, attain dimensions of  $30 \times 9$  cm.; the corollas are 8.5-9.5 mm. long, and the anthers (slightly larger than those of the type) are alternately 3.5-4.5 mm. and 4-5 mm. long.

DEPARTMENT OF BOTANY, U. S. NATIONAL MUSEUM  
SMITHSONIAN INSTITUTION, WASHINGTON, D. C.